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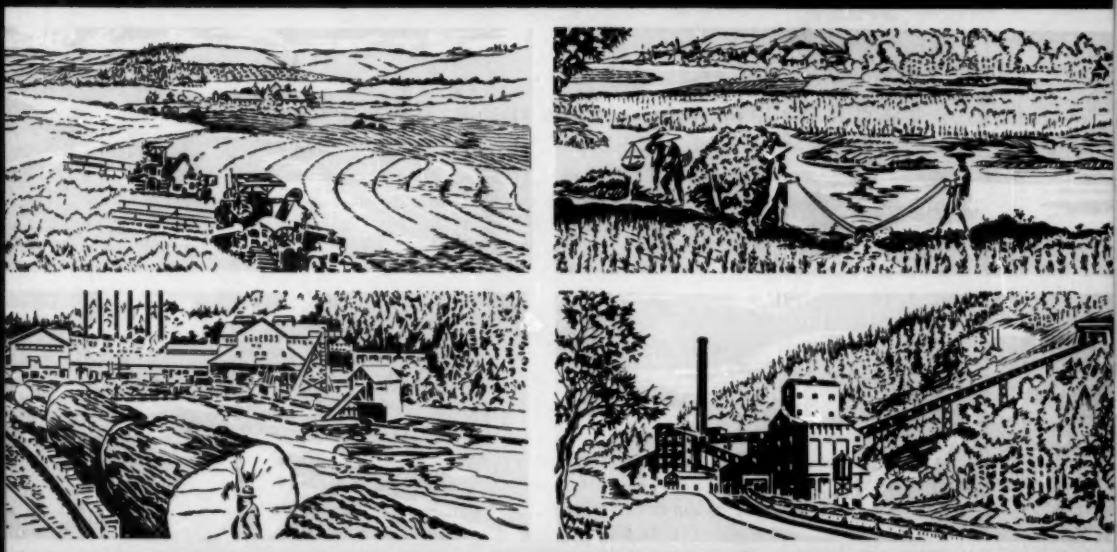

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THE PHILIPPINE SUGAR INDUSTRY: STATUS AND PROBLEMS

ALDEN CUTSHALL
University of Illinois, Chicago

FOR THE PAST 40 years the production and milling of sugar cane has held a dominant position in the economic structure of the Philippines. At the turn of the century, sugar cane was processed in crude mills using antiquated methods and was sold as muscovado or panocha sugar with production limited principally to domestic demands. A small amount of cane is still processed in this manner.

With the introduction of centrifugal mills (1914-1920) production increased significantly and reached the all-time record of 1,652,593 tons in the 1933-34 season. More than a million tons has been processed each year since 1920, except for the period from 1942 to 1950. With one or two exceptions the "centrals" were not in operation during the period of Japanese occupation. Many of them were damaged or destroyed by the Japanese, by Filipino guerrillas, or by allied bombings at the time of liberation. The period of 1945-1950 was one of reconstruction or rehabilitation of the industry.

Current Portrait

Postwar reconstruction of the industry was gradual. In some cases the mills had to be completely rebuilt. In other cases, new machinery and other equipment had to be imported. In one instance the mill site was a part of a U.S. military base and was not returned to its owners until late 1948. In a few cases the problems of reconstruction were largely financial, not so much the financial problem of the mill owner as the problem of the individual planter, especially the small planter. As late as 1950-51 there were inadequate points (seed stock) of good quality cane in a few districts.

During the 1953-54 milling season 25 raw sugar centrals produced 1,434,532 short tons of centrifugal sugar and surpassed both foreign and domestic quotas for the first time since the Second World War. (Only the 1958-59 and 1959-60 postwar output has been higher.) Recent production, 1955-60, has averaged about 1,400,000 tons and has supplied about 30 per cent of the total federal revenue. Only Cuba, Brazil, India and the United States produce more centrifugal sugar from cane than does the Philippines. Under the terms of the Philippine Trade Act of 1946 and the United States Sugar Act, the Philippines were permitted to sell (in the United States) 952,000 short tons of sugar annually under specially favorable conditions. The Laurel-Langley Agreement (December, 1954) revised this figure upward which helps to explain the somewhat higher production in the late 1950s.

The Republic has achieved this position of importance through a combination of physical, economic and political factors. Commercial sugar production in the Philippines is concentrated principally in central Luzon and on Negros, with smaller amounts from Panay, Cebu

TABLE I

CENTRIFUGAL SUGAR PRODUCTION (CANE), FOR SELECTED COUNTRIES

	Average	
	1950–51 through 1954–55	1958–59
	1,000 short tons	1,000 short tons
Cuba	6,078	6,577
Brazil	2,110	3,770
India	1,690	2,642
U.S.A. (includes Hawaii)	1,632	1,553
PHILIPPINES	1,190	1,522
Mexico	900	1,477
Argentina	773	1,184
Union of South Africa	689	1,135
Puerto Rico	1,228	1,087
China, Taiwan	724	1,066
Dominican Republic	657	1,020
Indonesia	578	854
Peru	628	825
Mauritius	535	580
Jamaica	364	430
World total	23,728	31,869

and Leyte (Fig. 1). Of the 25 operating centrals eleven are on Negros, eight on Luzon, and three on Panay. Negros accounts for more than 60 per cent of the tonnage produced; Luzon 25-30 per cent of the total. Most of the Luzon cane is grown on the Central Plain to the north of Manila; most of the Negros cane is on the western and northwestern parts of the island. Costs of production are high.

Sugar has never been an important item in the diet of the average Filipino. Annual per capita consumption of centrifugal and refined sugars is estimated at 25 pounds, about one-fifth the rate of consumption in the United States. Demand has increased since the war, however, with the tremendous increase in the soft drink industry and an increase in commercial baking and pineapple canning. The domestic quota is 280,000 short tons per year. Crude brown sugar (muscovado and panocha) is consumed at the rate of about 75,000 tons annually.

Physical Setting

In the Philippine sugar areas, the precipitation varies markedly both in amount and in seasonal distribution. At many stations the rainfall in any given year may vary significantly from the annual mean. In most districts there is some crop loss that reflects either the length of the dry season or inadequate total precipitation, or both. Annual averages vary from less than 60 inches at San Carlos on eastern Negros to well over 100 inches on northern Negros and northern Panay. Supplementary irrigation is practiced by some of the planters on Negros and Luzon, but in general it is a minor rather than a major factor in the sugar areas of the Philippines.

In general, commercial sugar plant-

FIG. 1. The Philippines. Most of the centrifugal sugar is produced on Negros, secondly on Luzon.

ings utilize level to undulating topography. Some of the production on northern Negros and on northwestern Panay is on gently rolling land and there has been limited post-war clearing on lower mountain slopes in both west-central and northeast Negros.

Sugar soils range from sandy or gravelly loams, clay loams, and clays of alluvial origin to residual soils developed from volcanic materials or from limestone bedrock. Most of the soils need fertilization and all good planters apply ammonium phosphate or ammonium sulphate either at planting time or when the cane is about a foot high, or both. Very little, if any, potash is used. (Nitrogen is the largest single element removed by the harvested sugar cane. The demand for phosphorus is low, for potassium only moderate.)

The Central System

The Philippine sugar industry is constituted of three groups of people—the landowner, the tenant or farmer, and the *central* operator or miller (Fig. 2). The *central* is responsible for the transportation of the cane to the mill and the milling of the cane. Most *centrals* operate narrow-gage railways for hauling the cane and the *central* administration decides the distribution of the cane cars to the planters (Fig. 3). In a few cases cane is hauled by truck, barge, commercial railway, and in one case by "turna-hauler." The planter is responsible for stripping and trimming the cane and transporting it from the field to the cane cars as well as loading the cane cars. For this field transportation, carabao cart, truck or portable field railway is used. Generally the *central* gets 35 or 40 per cent of the crop, the planter 60 or 65 per cent.

FIG. 2. Talisay-Silay Milling Company, amid the cane fields of western Negros, is a representative *central* with an associated distillery. Homes of the manager and his assistants are at the right center. A paved provincial highway lies between the scattered coconut palms (lower left) and the grounds of the mill.

FIG. 3. Small, bagasse-burning locomotive alongside the sugar warehouse, Hawaiian-Philippine *central*. The light, narrow railway is used to transport cane to the mill and to haul the bagged sugar (in cars at right) from the mill to the loading docks.

Culture Methods

Most of the Luzon farms are small, while on Negros there are several hundred large *haciendas*. About 90 per cent of the sugar is planted under the tenant system. The usual arrangement is a contract whereby the tenant gets a share of the landowners 60 or 65 per cent, normally either 25 per cent of the crop, or 50 per cent of the landowner's share.

Much hand labor is needed, particularly at the harvest season, because normally the burning of the cane field is not permitted in the Philippines. Burning of cane is permitted only near the end of

FIG. 4. Manual loading of cane. In some districts the cane is hauled to the mill in trucks; in other cases, the truck may be used to transport cane from the field to the loading station of the railway.

the milling season when the *central* management is certain that it can process quickly all the cane delivered to it. In a few areas labor is hired from surplus labor areas on other islands. Wages are low by American or Hawaiian standards.

The use of machinery and equipment in cultivating and harvesting operations has developed slowly (Fig. 4). The larger planters have tractors and other mechanized equipment, but the thousands of small planters rely upon the carabo for their source of power. The practice of using a tractor pool, operated by the *central,* is increasing and custom plowing is gaining widespread significance.

Trash is normally left on the surface after cane is harvested, then burned before the field is replanted. In some cases this reflects the lack of proper machinery to chop and cover the trash, rather than inability to recognize its value for adding organic matter to the soil (Fig. 5).

Problems

In general, the *central* is operated satisfactorily. Methods employed and sucrose recovery compare favorably with other sugar areas. The real problems of the Philippine industry are in the field rather than the factory. They may be summarized as follows.

The principal problem is associated with soil improvement, soil conservation, fertilization, and moisture control. This involves plowing and cultivation practices that will permit greater root development; more economical methods of weed control, really greater mechanization; improved and more scientific methods of fertilizer application; and greater use of vegetable matter to increase the humus in the soil and for conserving moisture during dry periods.

Secondly, greater overall mechanization of cane production is desirable. This includes more mechanization of plowing, seedbed preparation, fertilization, and cultivation operations. It also includes certain aspects of drainage, irrigation, and erosion control; mechanization for more efficient trash usage; and more mechanization of transportation of cane, particularly loading operations.

A third group of problems lies within the general realm of cane breeding, disease control, and insect control. This includes the breeding of disease-resistant, drought-resistant, and higher-yielding varieties; the evaluation of these new seedlings under the various soil and climatic conditions of the Philippines; and an efficient distribution of these research-proven varieties to the planters. Basically, this third group of problems is not markedly different from these same problems in other cane areas, but the solu-

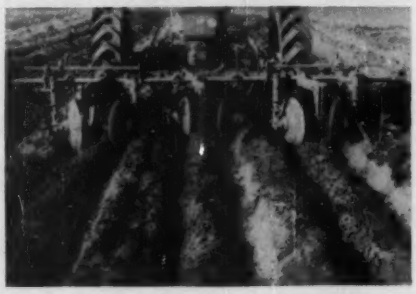

FIG. 5. Off-barring of ratoon cane in La Carlotta District, an operation that is normally done immediately after the trash has been burned and before new growth has started.

tion has yet to be adapted to the local situation. There are two sugar experimental stations on Negros (operated by the Philippine Sugar Institute) and there are experimental farms or plots at some of the more progressive *centrals* and at the University of Philippines College of Agriculture, but their collective results are inadequate.

A final problem concerns the industry as a whole; this is the utilization of by-products. Bagasse is baled and used as fuel in the small private locomotives and for domestic fuel on occasion (Fig. 6). Molasses is made into alcohol throughout the industry and the distilleries are well distributed among the *centrals*. The alcohol is used for fuel in trucks, tractors, automobiles, and the donkey locomotives of some of the *centrals*. There are only a few attempts to market alcohol and related products, other than industrial alcohol for fuel. There should be possibilities in the field of commercial solvents. Bias *central* has the first plant which made commercial paper from bagasse. It is a proven success and there are now others in India, Brazil, and the United States. The government has sponsored experimental research on the use of bagasse for making rayon and in the plastics industry. These are moves in the right direction. Sugar cane by-products offer definite possibilities in the Philippines.

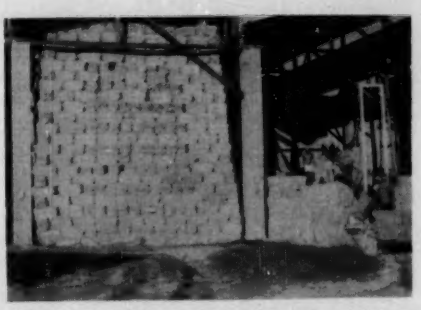

FIG. 6. Baled bagasse and baler (far right) at Hawaiian-Philippine *central*. This bagasse is used in the small private locomotives (see Fig. 3) or for domestic fuel by some of the employees of the *central*.

NATIVE URBANISM IN WEST AFRICA

ERNEST E. MELVIN
Chicago, Illinois

IT WAS in the lower Nile Valley that one of the most ancient and highly urbanized culture centers ever known developed. It was not until several centuries later that large urban centers are thought to have evolved in West Africa. In 990 A.D., the city of Kano was founded, its known chronology dating back to 1060 A.D.[1] In 1215, Timbuktu was founded as a political capital.[2] Within the next several decades, other large cities were established as political and trade centers.

During the latter half of the nineteenth century, Europeans began to visit with increasing frequency the cities of West Africa. In spite of European contacts during the past century, comparatively few people have systematically studied African urbanism. It is, therefore, the purpose of this paper to examine selected aspects of urbanism in West Africa.

Location of Urban Centers

In West Africa, it has been historically expeditious to locate urban centers where they best served the function of defense and where they were accessible to trade routes, agricultural land, and a potable water supply. Probably the least

[1] Derwent Whittlesey, "Kano: A Sudanese Metropolis," *Georgaphical Review*, XXVII (1937), pp. 177-80.

[2] John Leyden, *Discoveries and Travels in Africa*, Longman, Hurst, Rees, Orme, and Brown, London, 1817, p. 44.

important of these accessibility factors in Guinea Africa, as contrasted with the Sahara, is that of water. Here there is a comparatively adequate supply of water so that towns and cities were, from present indications, located without special reference to this natural resource.

The most influential force in the concentration of West African peoples into urban agglomerations was defense, coupled with the concept of the family (the basic unit of society) living within a walled compound (the basic settlement feature). The character of West African settlement can be seen in two major settlement types—the walled towns of circular shape of the West African grasslands and the fortified linear settlements of forested areas.

The factors of strategic location and accessibility were inextricably bound up because the function of major cities almost invariably represented an integration of political rule, control of trade routes, and market places. It was because of the ability of various tribes to rise above a subsistence type of economy that they were able to develop very complex political systems and economic and artistic specialization. The surplus type of economy was based largely on trade. For this purpose, it was necessary to control trade and to tax this source of income. Therefore, it was vital to select control points from which trade might be regulated and taxed. The continued importance of many cities depended on strategic location. An example of such an important city is Kano, which was the terminus of the central route through the Sudan and also a market for livestock and hides of the steppe country. Another city which had a similar position was Timbuctu, the terminus of a trans-Sahara route, which lay on the Niger River and had an extensive hinterland.

Not only were strategic location and accessibility of major settlement vital to trade routes, but these factors were also essential for the political control of territories lying distant from administrative centers. In order to gather tribute, to deal with domestic problems, to integrate central authority, to encourage marketing, and to meet religious ritual obligations which were centered in the capital city (whether pagan or Moslem), it was necessary that the site be somewhat central with respect to population and that roads be maintained to keep the capital in easy touch with the rest of the kingdom.

For agricultural towns and villages, the location of the site was with special reference to the plots of land worked or areas grazed, for it was necessary for people to walk to outlying places to tend their plots of land. In terms of the city-region concept, this is probably the most direct relationship between the urban agglomeration and its tributary land.

Basic Units of Urbanism

The types of urban settlement found in West Africa seem to fall essentially into the following categories: compound, subvillage, villages and towns, and city. Each of these categories becomes functionally more complex and larger in size in the order mentioned.

Compounds. The compound is the basic settlement unit among all West Africans. Each compound forms a distinct, more or less self-sufficing unit and often shelters an entire family group. Groups of compounds, when combined with services facilities, form villages, towns and cities. Because of its elementary and fundamental character in Africa urbanism, the compound must be considered as an urban entity. The compound, a cluster of huts within the confines of a high wall, serves as a place for sleeping, cooking and storing. It was formerly most important as a unit of defense for men and livestock. For this purpose, it was surrounded by a wall which was made either of thickets or mud and

which could be entered through a single doorway. In order to gain an idea of the function of compounds, it will be well to examine selected examples in detail.

Among the Ibo of Nigeria, the boundary wall is usually ten feet high and is thatched along the top to protect the mud walls from rain. Individual buildings are arranged helter-skelter within the compound to serve the head of the house. Each wife has her own hut and the sons somtimes build bachelor's quarters. Adjoining the house of the compound chief is a recess for household gods. Usually within the compound there is a sacrificial grove of one or more sacred trees. Besides this feature, there is also a crude shelter for the guardian juju (god) just inside the compound entrance.[3]

The layout of compounds among the Yoruba of Nigeria differs somewhat from those of the Ibo. Among the former, the compounds are rectangular in shape. There is a definite plan for placing huts. They look like small compartments built along three or four walls and around an open courtyard. The floors of the compartments surrounding the courtyard are raised a foot or two above the ground level and are drained by a hole in the main wall. Walls are made of puddled clay and thatched with grasses or palm-leaf mats similiar to those of the Ibo.[4]

Among some peoples of Southern Nigeria, houses are placed along each side of the four walls of the compound. The house entrance consists of a single hole in the center of one side. Cattle and other animals are kept in the central courtyard at night. These compounds show an unusual feature in the peculiar structure of the compound for the purpose of catching water. Roofs and slope of the ground are so constructed as to catch water and retain it within the walls. In this way the walls catch and retain run-off to be used by the people in the compound. While this practice isn't sanitary according to European standards, it is a very important feature of a settlement in an area where rainfall and groundwater resources are not plentiful.

In the Northern territories of the Gold Coast, compounds are comprised of a series of round huts connected with walls. They surround a central yard where animals are kept. As contrasted with Ibo and Yoruba compounds, huts are also provided for sheep, goats, and fowls. There are also circular shaped granaries.[5]

Subvillages. Subvillages consist of two or three compounds in which the members of a single extended family or members of two or three different families live. Subvillages are as purely residential as the few compounds which comprise it. There is not even a wall for defense, and residents flee to the mother village in time of danger. So little social (interfamily) organization exists that age-set groups usually do not operate. There is no political organization and virtually no commercial function for the subvillage's economic function is purely agricultural. The subvillage, or hamlet, is completely dependent upon the mother village for feasts, ritual, political control and defense. In addition, the subvillage is a semi-permanent unit, seldom lasting for more than three generations.

These subvillages (Tunga) have three different origins. The most common subvillage is that founded by two or three young married couples who select a site outside the mother village.[6] Another way of establishing these subvillages is through the settlement of a foreign group who wish to accept the political protection of the mother village. The

[3] G. T. Basden, *Among the Ibos of Nigeria*, J. B. Lippincott Co., Philadelphia, 1921, pp. 50-2.
[4] *Ibid.*, p. 50.
[5] A. W. Cardinall, *The Natives of the Northern Territories of the Gold Coast*, George Routhledge and Sons, Ltd., London, p. 99.
[6] S. F. Nadel, *Black Byzantium*, Oxford University Press, N.Y., 1942, pp. 34-9.

third type is actually a semi-private one in that the people comprising the new settlement are usually dependents (or former slaves) whom wealthy agriculturalists have placed on land which has been assigned to them.

Towns and Villages. The village or town is the fundamental self-contained unit of settlement in that it performs its own services and perhaps those of its associated subvillages. It is also the basic unit of social and cultural integration just above the family level. Another distinct feature is that, as opposed to subvillages, villages have a definite territoriality and are relatively permanent. Centered within the village are definite functional specializations which are observable in the layout of the village. The inhabitants may all belong to an extended family or to different families. The population is usually within the clan and tribal framework.

Villages are usually situated in the immediate vicinity of a stream on the high promontory between the stream and its flood plain or away from the stream on hill tops or precipitous heights. Thus, they always have the advantage of higher elevations for defense purposes.

Most typically, villages are based on a linear pattern with contiguous huts on two sides of a broad road or system of parallel streets with the main side one at the center.[7] In a simple village, the road may lead into a plaza built up on three sides. The defensive character of the village is shown by guardhouses erected at each end and narrow gates which serve as the only entrances to the settlement. Compounds extend back from the roads and the village flanks are protected by trees, ditches, and bamboo splinters.

Within these villages are four basic kinds of functional units: (1) contiguous huts which flank the plaza or main road; (2) centrally located granaries; (3) guard houses and town hall; (4) central shade for idlers and skilled workmen. There are no regularly assigned market areas to preclude the entry of a large number of non-residents. Rather, markets are set up regularly in a "cleared square in a lofty spot" which is mutually recognized.[8] Although the disposal of refuse is literally via the back door, real effort is made to keep the streets and plaza clean. These spaces are cleared of grass and litter every day, and the space immediately in front of huts is cleaned by its occupants.

The town has the same basic characteristics as the village but with more specialization and elaboration. Also, the town may be the seat of an administrative district. The inhabitants may be of different clans and may include many families of several extended families, all falling within the tribal framework. There may be a minority of foreigners for purposes of administration or trade. An average population of about 1,000 is sufficient to support the town with its associated degrees of elaboration and specialization. Large towns may be divided into two or three wards for administrative purposes. There is usually one central market place with few structures to accommodate traders or their goods.

Among Ibo villages, there is apparently no symmetry of layout as to disposition of compounds. Roads circumventing scattered compounds converge in an open meeting place which is intimately associated with the chief's compound. The major nodal point among nearly all towns and villages is the chief's compound. Each village or ward of a town has its own chief in whom is vested leadership in religious, social, political, and judicial affairs. Thus, as compared wth Europeans and American towns, the ordinary functional units are comparatively few because they are found in the person of the chief or are performed within his compound.

[7] Adolphe L. Cureau, *Savage Man in Central Africa*, London T. Fisher Unwin, 1915, p. 206.

[8] *Ibid.*, p. 250.

However, there are specific functional units in addition to the chief's compound in Ibo villages. These are the market place, where surplus goods are bought at regular intervals for exchange, or in modern times, for money; small, crude fetish houses; and the public meeting ground. The latter is used for litigating differences between individuals and/or households, for the celebration of fixed feasts, for the offering of common town sacrifices, and occasionally as a market place.[9]

Among villages in the Cameroon grasslands, the focal point of the village is the plaza between the rectangular pattern of compounds. This feature is similar to that of forest villages because of the necessity of defense, but numerous functional units have overflowed the limits of the wall, due in part to the availability of land which can be easily cleared. The market place with its associated trader's hut is located on the road near the village. The native court is also located outside the walls. The most important unit is the chief's compound which is associated with the workmen's huts, numerous small huts for chief's wives, bachelor's quarters for the chief's sons, the sacred instruments hut, and the cemetery of former chiefs.

In the Cameroons, market places function as the public meeting ground among the Ibo. They are primarily used for selling of native wares, as a proclamation area used by chiefs to talk to their peoples, where the bride shows herself before marriage to evince preparedness, where meritorious dances and ceremonies are held to honor individual, and formerly where capital punishment was administered.[10]

While people are usually of the same tribal stock, some changes have been made in population composition by conquest and the disintegrating effects of war when villages may be decimated and partially replaced by elements of the conquering population. In northern Nigeria settlements have been altered by the Hausa through the addition of new ethnic elements (Fulani as well as Hausa), by the establishment of permanent trade centers in self-sufficing villages, and by the establishment of Moslem mosques and schools. Europeans have made similar changes by the founding of missions, schools, and trading posts. Thus, in the twentieth century, there have been material changes in the make-up of village and towns but still very little specialization such as found in cities.[11]

Cities. In general the growth of large cities in West Africa appears to have been coincident with the development of political functions, trade, defense, and in a minor sense, industry.

Before Timbuctu was founded, Gualata had acquired a great trade advantage which was lost when Timbuctu was founded in the capital of the Hausa Kingdom. Because of the location of Timbuctu and other cities in the strategic Sahel area, these cities were often the scene of migrating tribes battling a series of well-established kingdoms. Following such a battle, Timbuctu became the capital of the Melle and Songhay peoples about 1450.

Timbuctu and Kano were the dominant cities of West Africa until 1600 A.D. when Bambouk rose to the fore, and in 1618 it was described by John Leydon as a "center around which resolved all commerce and splendor of interior of Africa."[12] Other cities of the Sudan which served as seats of great empires included Jenne, Kano, Katsena, and Kuaka.

Commerce and industry usually accompanied the political function in the development of African cities. A vigorous trade was established west-east along the

[9] G. T. Basden, *op. cit.*, pp. 45-9.

[10] L. W. G. Malcolm, "Huts and Villages in the Cameroon, W. Africa," *Scottish Geographical Magazine*, XXXIX (1923), 21-6.

[11] C. K. Meek, *The Northern Tribes of Nigeria*, Humphrey Milford, London, 1925.

[12] John Leyden, *op. cit.*, p. 213.

Sahel, between the great African metropolises, and more importantly north-south between equatorial Africa and Mediterranean Africa. Commerce of the pre-European era consisted mainly of slaves, ivory, salt, gold, camels, cattle, kola nuts, metals, tools, cotton textiles, and leather goods. In such cities craft industries (mainly leather work and textile weaving) became highly developed. In addition, there were also silver and goldsmiths and iron workers. Commerce was directly connected with the politicial function as all goods had to move through the king's compound so that a tax might be collected. Also, much of the local industry was supported by the kings.

African cities are also metropolitan centers in a very real sense in that they are politically, economically, and culturally dominant over their hinterlands. A city is usually the seat of a major administrative division and is directly connected to tributary towns and villages by roads and administrative machinery. Inhabitants of cities are principally of the same tribe, but also present are many people from other tribes or racial groups. The population of cities numbers tens or hundreds of thousands of people.

In terms of function, cities are the sites of concentration, centralization, and specialization. There is usually a central market place with one or more other market places within the built-up areas at intersections or at the city gates. Within the central market place, and in some subcenters, provision is made to house trade goods and commercial transactions. Furthermore, in towns and villages, trade is operative on specific market days, whereas in cities, marketing and commerce are daily functions. Cities are also seats of local industry, many products of which are sold and even fabricated in the market place. Trade as a function is constant and localized to the point that cities have developed commercial cores similar to European and American cities.

In order to understand better the nature of West African cities, let us examine a few in detail. Kumasi, destroyed by the British in 1874, had not been completely rebuilt even in 1900. At that time, it was characterized as being composed of native huts, swish houses, and the king's palace.[13] Kumasi was the center of a state system which fostered the trade of the coast and connected it with the trade of the hinterland. It was also the capital of the Ashanti Confederation and served as a religious and political center. Within the city, sanitation was regulated by wards in which headmen ordered women to clean the entire ward at regular and stated times. Roads between the capital and its outlying territories, as well as those between townships, were cleaned and maintained by men. In contrast with many urban areas, here there were erected lavatories and places of convenience.[14]

Benin City, called Oedo by natives, was five or six miles in circumference and was bounded by a wall of trees with an earthwork on one side and bounded on the other side by a morass and thick bush. It could be entered by several gates which had doors of a single piece of wood. It was described by R. H. Bacon in 1898 as "an irregular, straggling town formed by groups of houses separated from each other by patches of bush."[15] The main elements of the town were the king's compound, the juju place, palaver house, and individual compounds. The juju place (for religious functions) was 150 yards long and 60 yards wide and was surrounded by a high wall with a long shed at one end running the whole breadth where the altar was located. The palaver house was open in the center with

[13] C. H. Armitage and A. F. Montonaro, *The Ashanti Campaign of 1900*, Sands and Co., London, 1901, pp. 217-18.

[14] Casely Hayford, *Gold Coast Native Institution*, The Atlantic Press, London, 1903, pp. 28-9, 110.

[15] R. H. Bacon, *Benin, The City of Blood*, Edward Arnold, New York, 1898, p. 86.

a roof over one end with red mud seats around the edge. All these elements were intimately associated with the king's compound so that all services and functions were localized at this place. Benin City was divided into three administrative districts, each governed by a high state counselor.[16] Like Kumasi, Benin City is now connected with its subject urban centers by communications and administrative functions. When criminal cases are too complex or serious to be settled locally, they are brought to the capital for solution by the king and his counselors.

The city of Kano is thought to have been founded at Dalla Hill on the site of workable iron ore. In the eleventh century, it became a political capital and has remained a major Nigerian city. It is today the second largest city of Nigeria, having a population of over 200,000.

The wall of the city ranges from 30 to 50 feet high and runs eleven miles around the city. Only one-third of the area is actually built up, as in the case of Katsena. Some students have thought that the great amount of unused space, usually filled with brush and tropical grass, was evidence of shrinkage of the population. Actually, this land could have been devoted to the growing of food supplies during times of siege.

Today one finds definite functional areas within the city of Kano. It has spread from the original site at the base of Dalla Hill to the southeast and is now concentrated around the market area of the Jakara River and Wambi Gate, one of the fifteen entering the city. There are other submarkets near the gates and throughout the residential area, but the Jakara market is the major one. Within this market, there is some specialization, each a major type of goods being sold in the particular spot of the central market place on the north side of the Jakara. Firewood is sold on the west side as are slaves in sheds on the northwest corner of the area. The slaughtering place is near the river which receives the blood and offal from the killing of livestock. In the northeast corner of the area, camels and pack oxen are sold. The palace of the Emir is in the southeast quarter of the city in the center of the residential area. Immediately surounding the residential area is a series of cemeteries. Outside the residential area and between the cemeteries are fields and waste land.

Not only does the Emir and his 46 principal officers govern the surrounding territory, but they also directly control the municipal government. The city is divided into 137 sub-units which are grouped into four wards. Each ward is governed as an independent village with its headman and council of elders, all of whom are responsible to their respective headmen. These divisions have been established for purposes of administration, sanitation, and police action.

The population of Kano is made up of four major racial groups. The Fulani, the ruling people, live in the southern quarter near the Emir's palace, with the Hausa people occupying a zone north and west of the Fulani. North of the Jakara River live the Nupe and Yoruba tribesmen. At the original core live immigrants from Lake Chad and the Upper Benue River Valley. In 1865, there were no less than 77 subgroups living in Kano.[17]

European Influence

European influence has been felt on the various forms of native urbanism. Especially during the twentieth century, redevelopment along European lines has occurred. Because there is no longer need for defense, old city walls have been

[16] P. Amaury Talbort, "Historical Notes," Vol. I of *The Peoples of Southern Nigeria*, Humphrey Milford, London, 1926, p. 165.

[17] H. Barth, *Travels and Discoveries in North and Central Africa*, Harper and Brothers, New York, 1957, p. 507.

demolished or have wasted away from disrepair. Also, it has been possible for natives to construct compounds closer to plots of land which they cultivate, as it is not necessary to limit residence to places within easy reach of defense points. This has been the first opportunity for African peasants to settle in dispersed places.

New specialization of function has resulted from the introduction of new functional units: schools for formal education, missions and mosques for religious (and educational) purposes, and new administrative offices. Some towns have become "twinned" by the establishment of European quarters totally removed from the native city. Thus, in modern times, the "twinning' of major centers has appeared in the superposition of European urbanism on or the placing of European urbanism adjacent to Native urban agglomerations. Since the beginning of the era of colonialism, seeds of European urbanism and industrialism have been sown in West Africa with the result that both population and functional specialization have increased.

Summary

Africa is one of the most highly urbanized areas on the face of the earth. This was motivated by reason of defense, political security, and desire to control strategic points to command trade routes. African urbanism resolves itself into five major types or urban settlements: compound, subvillage, village, town, and city. Each of these types is clearly distinguishable and forms part of the hierachy of urban places.

Upon the structure of r ative African urbanism has been imposed both physically and culturally the influence of European society. Further changes in the morphology and function of these basic units are likely to occur, perhaps at an accelerated rate, as national destinies and economies fall more and more into the hands of local powers.

AN EXTENDED GEOGRAPHY FIELD TRIP

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ONE OF THE PRINCIPAL UNITS of study in many of the junior high schools of Pennsylvania is the geography of the commonwealth. The following is a summary of the organization and associated field study for a course in the Geography of Pennsylvania as conducted at the Hampton Township Junior-Senior High School, Allison Park, Pennsylvania.

Classroom Organization

Areas for study are selected by student committees. These investigations are organized according to the geography regions of our state as outlined by Raymond and Marion Murphy in their text, "Pennsylvania Landscapes." These committees and their leaders are chosen by the democratic process. Before the groups begin to function as individual research units, the instructor and properly-prepared student associates develop a sample region which will act as a guide for the class in their research, organization, and presentation. After the development of this regional unit, students grouped at their laboratory tables will be utilizing their previous-learned skills and techniques. This is accomplished by the students using such geographic tools as pictures, maps, graphs, and statistics to acquire knowledge of the regions assigned.

At various stages during the investiga-

tion and organizational process, the instructor introduces by means of varied techniques, general aspects of the geography of the state which will act as background material and a good foundation upon which the more concentrated research studies can be presented. These associate learnings follow a developmental sequence which includes the descriptive and historical geology, the major adjustments man has made to the climate and topography, and the water resources of the state. By the use of road and other maps, functional locations are learned.

When the research projects are completed and large wall-sized maps of the areas assembled, the groups are ready to present their projects to the class using carefully selected pictures, maps, and other tools of geography. The reporting committee is seated in front of the room and presents its findings by means of a public address and tape recording system. When the report is completed, the tape is replayed while the students at their seats may check their notes and ask questions. Each report is followed by a short quiz.

Trip Preparation

With this background and interest in the study of geography, a Geography Club was organized in September 1958. Preparations for the trip that will be described began in September of 1959.[1]

After the beginning of the school year, a desire was expressed by the club members to visit and experience first-hand a region of Pennsylvania they had studied in eighth grade geography. It was decided that the northeastern part of the state would make an excellent region for study. Northeastern Pennsylvania contains three geographic regions: (1) the Pocono Resort Region, (2) the Anthracite Region, and (3) the Northeast Dairy Region. In order to have sufficient time given to study this region thoroughly the group decided to organize a week-long field trip.

Following the selection of the area to visit, our major problem became one of raising funds. We felt that one concentrated effort would produce better results than numerous small projects. Therefore, during the Christmas holidays, fruit cakes were sold by the club members.

In January the first contacts were made with agencies and persons who might be of assistance. The prime need was an inexpensive and centrally-located place to stay overnight where we would be able to prepare our own meals. Since the club is a member of the American Youth Hostel Organization, we secured the privilege to use their large, well-equipped hostel at La Anna located in the heart of the Pocono Mountains. Chambers of Commerce and numerous individuals were contacted—specifically, Mr. C. W. Bigelow, manager of the American Automobile Association in Wilkes-Barre, and Dr. H. F. Creveling, Chairman of the Geography Department, East Stroudsburg State College. With the help of these two men in particular and numerous others in general, we were able to formulate a tentative schedule of events. Shortly after the completion of preliminary plans, the sponsor made a trip to the selected area to meet people, make final arrangements, and check all routes and tour schedules. With this information the club members formulated their final plans.

In order to keep the cost of our trip at a minimum and see the most of the regions involved with the least amount of money, we planned to prepare our own meals. "Duty" rosters were listed for cooking and clean-up assignments. Menus

[1] In June 1959, the newly-organized Geography Club visited the Southeastern Region of Pennsylvania and crystallized their previous learnings of major geography relationships. An account of this trip appeared in the November 1959 issue of *The Pennsylvania School Journal* in an article entitled, "Holiday for Learning," by Nancy Louise Evans.

were discussed and drawn up by the members with the aid and advice of Mrs. Virgil Bears, Head Dietician of our cafeteria and Miss Nancy Evans, school nurse. Various individuals were assigned to say "grace" before each meal. This planning and preparation of their own meals led to a greater appreciation of the problem of food preparation on the part of the club members.

While final plans were formulated, another group was preparing a brochure which would act as a guide for the entire trip. It contained all the menus, "duty" rosters, and places we would see and visit. It also gave a brief geographical description of the areas we would visit restressing the previously-learned geography relationships. In order that parents could be informed first-hand of trip plans, a special parent night was held in the school auditorium to which all club members and their parents were invited. At this gathering a typical club meeting was held. During the meeting such items were discussed as the proper dress to wear, need for fresh hair cuts, desired conduct, and the actual places we were going to visit. In this way all parents received the same information concerning the arrangements. At this time we made known the "telephone-contact" plan. Three times during the week a call would be made back home to the first person on a pre-arranged list, informing them of our activities and welfare. The first person would then contact the second, etc., until all had been informed of the group's progress and well-being.

The Field Trip

It was with great expectations that the group awaited the arrival of our chartered bus on June 9, 1960. This was the first Monday after the dismissal of school and all preparations had been completed down to the construction of a large sign stating the name of our club and school. Most of the first day was spent traveling from Allegheny County to the La Anna Youth Hostel. Along the course of our journey items of particular interest were closely observed. We partook our noon meal at Shipellany State Park which overlooks the confluence of the north and west branches of the Susquehanna River at Sunbury, Pennsylvania. These were rivers whose patterns we had learned in class. The evening was spent indoors due to inclement weather. Most were ready for bed at an early hour due to riding fatigue. During the hours from twelve o'clock to six o'clock in the morning, a "night watch" was in effect. Groups comprised of two upper-class boys kept watch for a period of one hour and a half. Their purpose was to notify the chaperones in case of sickness and to alert the members in case of emergency. Since each boy had only one period of watch in the entire week, the loss of sleep was negligible.

As an "on the spot" introduction for our three days' visit in the region, Tuesday morning the club went to East Stroudsburgh State College. There Dr. Richard Wildrick presented an excellent talk and informal discussion concerning the geography, geology, and history of the Poconos, Anthracite, and Northeast Dairy Regions. This not only proved an effective introduction for our trip, but the college atmosphere created a feeling of learning among all and helped us to adjust mentally for the educational events which were to follow.

After leaving the college, we went to the Capitol Slate Quarry at Bangor, Pennsylvania. Here the foreman, Mr. John Knittle, described and interpreted the life cycle of slate from silt to finished product. Along the way to and from the quarries, a running commentary was given by the sponsor concerning the topographic features such as kames, pot

holes, drumlins, and other glacial features. This region lies along the southern limit of a terminal moraine in northeastern Pennsylvania.

At lunch a graphic explanation of the geology and related geography of the region was given at the Delaware Water Gap.[2]

Later we visited an exposed coral reef in the Stroudsburg area. Here the students enjoyed an hour digging and identifying fossils which abound in the formation. Tuesday evening the group attended the nearby Pocono Summer Playhouse where the broadway production, "Susan and God," starring Joan Fontaine, was playing.

Wednesday was set aside for the observation and interpretation of the geography relationships of the Northeastern Dairy Section. Since we were going to follow the dairy process from the raw material to finished product, the ultramodern dairy of State Senator Sordoni was our morning stop. Here we saw an excellent example of scientific dairying. Everything from sleek herds to the electrically-charged fly-killers in the dairy barns was viewed, explained, and discussed. With this excellent background, our trip to the Altman milk processing plant at Ardovin, Pennsylvania, took on more meaning. Here we watched in-coming fresh milk transformed before our eyes into powdered milk, cottage cheese, and butter. The plant manager, Mr. Eller, went to great detail to explain the economics and marketing involved with his industry. The Northeast Dairy Region is also known for its growing of buckwheat. The production of this grain is related to the short growing season, thin soils, and its association to the honey industry. To give realism to these geography relationships for the club members, the sponsor had communicated through Mr. Bigelow with Reverend Ned Lintern, Pastor of the Center Moreland Methodist Church. As a result, the youth group of Reverend Lintern's church prepared a buckwheat-sausage dinner. The meal was comprised of only locally produced foods including the buckwheat flour, sausage, strawberries for short cake, maple syrup, milk, and butter. The "life saving" signs thoughtfully posted on all roads leading to the church, the genuine hospitality, abundant delicious meal, and the subsequent social evening of square dancing and group activities are continuing happy memories of these people in Center Moreland.

Thursday was the culmination of our busy week. The morning and early afternoon were spent touring the Anthracite Region. Here the various effects of a depleted extractive industry were discussed. In addition, certain aspects of redevelopment were indicated. Our final experience was the visit to a model coal mine where the differences between anthracite and bituminous mining were reviewed. The afternoon was spent at the Tobyhanna State Park swimming, playing ball, and eating.

Post Trip Activities

After the completion of the field trip, the executive committee and sponsor met for the purpose of writing thank you notes, paying bills, and preparing a financial statement which was mailed to every member. Included in the correspondence were special messages of appreciation to Mrs. Hazel Hanchett, sponsor of the Hampton Junior High School Geography Club, Miss Nancy Evans, school nurse, and Mr. John McIsaac, high school in-

[2] In preparation for the trip, Robert N. Thomas, club sponsor, had spent several hours with Dr. H. F. Creveling, Chairman of the Geography Department, Stroudsburg State College. At this time Dr. Creveling had shared his broad knowledge of the total area with Mr. Thomas. While on the tour, Mr. Thomas interperted these major aspects of the region for the boys and girls of the group.

structor who was in charge of personal and water safety. These people were gracious enough to donate a week of their time to help chaperone the group during its stay in northeastern Pennsylvania.

All the various product samples, fossils, pictures, maps, and other material of an educational nature that were collected on the trip were donated to the Geography Department to become a part of our permanent museum. In this way future classes can benefit from the use of these geography items. They also act as a stimulus to other students who become interested and desire to join the club. The trip preparation and participation along with the presentation of a geography assembly program and other varied club activities helps to make this group extremely large.

Program of Trips

This trip is one in a program of five which when completed by an individual student entering the junior high club in the eighth grade will give him first-hand geography experiences in all of the geographic divisions of Pennsylvania.[3] The four additional field trips radiate from various overnight areas. Each covers a particular section of the state.

The total cost of our week-long trips averages 700 dollars. Therefore, the cost for each individual participant for the five days and four nights was approximately 15 dollars.

The immediate purpose of these trips is to clinch previously-learned geography relationships about Pennsylvania. At the same time the boys and girls are putting to use their geography skills and techniques.

In Summary

Scientific examination of the world about them under proper supervision will enable these students to develop good observational habits. These proper habits will help them to better interpret what they see on individual and family trips for the remainder of their lives.

[3] Membership in the junior high club is limited to grades eight and nine, while the senior high club includes grades ten through twelve.

DOMESTIC USE AND REUSE OF WATER SUPPLY*

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OUR INDUSTRIAL and economic development together with the expanding population have, in the last decade, contributed to about 97 per cent of the nations growth in some 170 sprawling metropolitan areas, each with more than 50,000 population and with population densities of more than 150 persons per square mile. These metropolises include only 7 per cent of our land area but now contain some 60 per cent of our population.[1] Dense concentrations along the main arteries of transportation and including the largest centers of industrial activity now form almost solidily urbanized ribbons along the northeast coast and, in our own state (Ohio), along the southern shores of Lake Erie. Our increased standard of living in this rising economy have changed the living habits of millions. It has produced two-bath

* Paper presented at the fall meeting, East Lakes Division, Association of American Geographers, Bowling Green State University, Bowling Green, Ohio, October 8, 1960.

[1] Ralph E. Fuhrman, "Metropolitan Sewage Facilities," *Water and Sewage Works*, 106:R280 (September 15, 1959).

suburban homes with automatic water using appliances, air conditioning, and spacious, well-tended lawns and gardens, all of which contribute to increased domestic water use. Many municipalities now report double the individual usage factors considered average for design purposes some ten years ago. The industrial growth which supports the population increase and higher economy has also increased water demands for cooling, cleaning, and production. Industry further contributes to the problem by its disposal of used and highly polluted waters.

Expanding water systems, necessary for support of our ever increasing domestic, commercial, and industrial activities, attempt to keep pace with the new developments and require not only additional distribution networks but also additional supply sources and expanded treatment facilities. Additional facilities are also required to collect and remove water-borne wastes to final disposal of the effluent into the waterways which again become the sources of supply for the utility cycle.

In a recent address, Mark Hollis, Assistant Surgeon General, USPHS, pointed out that the transition from rural to urban living is wedging closer and closer the sewage outlets and water intakes, thus reducing our margin of health safety and necessitating improved facilities and operations in water treatment and domestic and industrial waste disposal.[2] During this transition period, both water supply and waste disposal systems undergo growing pains from unitized systems serving single-family dwellings to the large complete treatment facilities serving entire communities. The ultimate development reached for each specific area requires consideration of economics as well as the public health criterion. The ultimate goal is usually reached in a series of steps; each of which expands to its ultimate limitations before the next step is taken.

[2] Mark D. Hollis, "Pollution and National Water Resources," *Journal, American Water Works Association*, 52:959 (August, 1960).

Steps in Development

In the early stages of growth a future urban area may depend upon individual wells and individual waste disposal units for each family dwelling. As the population concentration swells, the areal water demand increases putting a heavier burden on the aquifer. At the same time the individual waste water disposal units also weigh heavier on the drainability characteristics of the soil. This also creates the health hazard of possible contamination from seepage of the waste water into the water producing aquifer. Further areal developments usually occur on the demands of the residents to provide a water supply system or through the purchase of water from a contiguous existing system. In either case an expansion of existing facilities is required. The next phase in the development of the mature urban area is to furnish a centralized waste collection and disposal facility. Again the factors of economics and public health will dictate the size of the facility and the type of treatment involved as well as the final disposal of its effluent. Proximity to a well-established metropolitan area may dictate that waste collection and disposal be made a part of the already existing facility. Or separate facilities may be provided which at a later date might be combined with several other facilities serving adjacent development areas and resulting in the formation of a large complex serving a vast metropolitan district.

To further complicate the problem wastes contributed by industry are increasing both in volume and in strength. A new array of pollutants has appeared on the scene in terms of synthetic organic chemicals, inorganic and often toxic metallic wastes, and radioactive materials. As Mr. Hollis further pointed out in his paper, "Pollutants *must* be kept below

levels of personal health damage. They *should* be kept at levels compatible with all legimate uses of water. It is *desirable* to keep them within the bounds of aesthetic considerations."[3]

Depletion in Ground Water

Many areas are now experiencing depletions in existing ground water supplies. This results in the expansion of surface water use which requires more concentrated treatment for safety due to increasing waste discharges from industries and communities. This means that the available water will have to be used over and over again, and it will have to be cleaned each time it is used. It has been estimated that for many areas an extensive reuse of streams amounting to some six times will be common within the next ten years.[4]

A report recently released by Senate Select Committee on Natural Water Resources and prepared by the USPHS for the committee, made the following points:[5]

1. An adequate supply of fresh water, for the immediate future needs from the Nation's rivers and lakes, requires that municipalities spend a total of 4.6 billion dollars to catch up with treatment needs by 1965. Additional expenditures of 575 to 600 million dollars per year are required to satisfy the backlog of industrial waste treatment needs.

2. Research expenditures total less than 6 million dollars per year; they are small compared to the backlog.

3. The report estimates that total fresh water uses will equal developable supplies by 1980 and may double the water available by the year 2000. This means that all available water will have to be reused. We can no longer improve on the *quantity* of fresh water; we must improve on its *quality*.

That this national problem affects the state of Ohio is brought out in Report No. 1, Ohio Water Plan Inventory by the Department of Natural Resources. Public water supply systems in the state have grown from 172 in 1900 to some 600 today. The present water demand on these sources amounts to more than 1 billion gallons per day. The report also points out that new water supplies are becoming more expensive to develop and distribute, and municipalities now depending on low-cost well water supplies may have to depend on more plentiful surface supplies in the future. Many of these public supply systems are already near their capacity output.

A recent report of the Committee on Public Information of the American Water Works Association presented the following résumé of conditions of the entire 18,000 functioning water facilities in the United States:[6]

1. One out of every five is deficient in supply.

2. Two out of every five are deficient in transmission capacity.

3. One out of every three is deficient in pumping.

4. Two out of five are deficient in treating capacity and may need additional facilities to provide a more desirable quality product.

5. Ground storage and elevated distribution tanks are 29 per cent and 43 per cent deficient respectively.

6. Distribution system improvements are required in some 57 per cent of the systems.

7. Many systems need improved administrative and accounting procedures.

The above deficiencies may be summed up by stating that present facilities are inadequate to meet the present demand.

[3] *Ibid.*

[4] *Ibid.*

[5] Department of Natural Resources, State of Ohio, *Ohio Water Plan Inventory Report No. 1* (January, 1959).

[6] Raymond J. Faust, "The Needs of Water Utilities," *Journal, American Water Works Association,* 51:701 (July, 1959).

It cannot be denied that development and management of water supply systems is a large industry. Capital investments and public and private water source development in this country amounts to about $1,028 per capita or a total of $179 billion based on 1958 replacement costs.[7] National investments in water resource developments reported as a percentage of national wealth predicts an increase of from 9.5 per cent in 1958 to 12.2 per cent in 1975. Sewage facility investments have lagged behind those of water and are reported as about $25 billion in 1958. A more rapid increase is evident in recent years because of enforcement of stream pollution abatement programs. It is estimated that the capital investment value will rise to some $41 billion in 1975.

Adequate Planning

What can be done to offset or to make inroads on the ever increasing water supply and concurrent pollution problems? The key to the solution of the major difficulties is adequate planning. Advance urban planning and zoning before crises occur is preferable to direct an orderly growth and expansion and to insure maximum benefit of use of our water resources to the majority of the population. The problems of water supply, use, and disposal in a metropolitan area are interdependent and produce far-reaching effects upon the metropolitan area inhabitants and often upon the surrounding area. Obviously such broad scale problems must be settled on an areal basis, requiring cooperation and participation of all political entities in the affected regions. In the immediate future, we must make use of what water we have. Impoundments and aqueducts can make available for use a larger percentage of the existing supplies, and application of sound engineering principles can do much to reduce the pollutional loads.

An orderly educational and publicity program should coincide with the planning to inform the general public of the planning sequence, to point out the benefits of the program, and to make the public aware of the necessary costs to provide adequate services.

A suitable financial structure based upon bonding procedures as directed by law and subject to prescribed limitations must be established. Most supply systems and treatment facilities can be undertaken and financed locally. Federal grants of $50 million per year are available up to $250,000 per project of 30 per cent of the total cost, whichever is less, for municipal sewage plant construction. To qualify for funds the project must be part of the over-all control program developed by the USPHS, other Federal agencies, and the state and interstate pollution control agencies. A review of the municipal rates for services is desirable to insure realistic return on the investment. The law is specific that municipal corporations owning their own plants and furnishing water to the public must charge just rates. The utility, however, is not required to supply services at cost; it may earn a fair profit. The public in turn must be conditioned by proper educational measures to the necessity for any rate increases in order to secure a suitable service.

New Sources of Supply

The ever increasing demands necessitate continuing search for new sources of supply. Land aquisition of probable reservoir sites should be planned at an early stage to secure the benefits of lower land values. Consideration must also be given to the amount of land purchased to provide adequate pollution protection at the reservoir site and to avoid liability due to inundation of property at high water stages.

It has been predicted that in 20 to 30

[7] Walter L. Picton, "Investment in Water Projects 1900-1975," *Willing Water*, 3:10:3 (October, 1959).

years the most reliable source of used water will be domestic sewage. Industrial wastes are expected to increase, but the amount per unit volume will decrease thus rendering reclamation practices more difficult. Reclamation of waste water, particularly domestic, will have a place in future plans regardless of the current public opinion.

The present methods for treating sewage and industrial wastes must be re-evaluated, and new treatment processes based on entirely new concepts and principles may be required. New pollutants require new evaluations and a revision of standards for measuring the amount and affect of the pollutant. The significance of the conglomerate build-up of new contaminants in our water supply system is not fully understood. Here research and development will play an important role in seeking better and more economical means of reconditioning used water supplies. This will require major coordination and concentrated efforts of qualified chemists, bacteriologists, physicists, engineers, and others from allied discipline and result in a pooling of knowledge toward the common goods of reduced pollution and more potable water supplies.

Lastly, the managerial responsibilities will increase with the complexities of the problem. Managerial personnel must be developed who are capable of appraising the future and of meeting new problems with new solutions. The manager must develop a master plan for his service. Once it is developed he must be able to place it before the public in a favorable light to secure necessary financial support to insure its being put into action.

THE GEOGRAPHIC "CROSSWORD PUZZLE"

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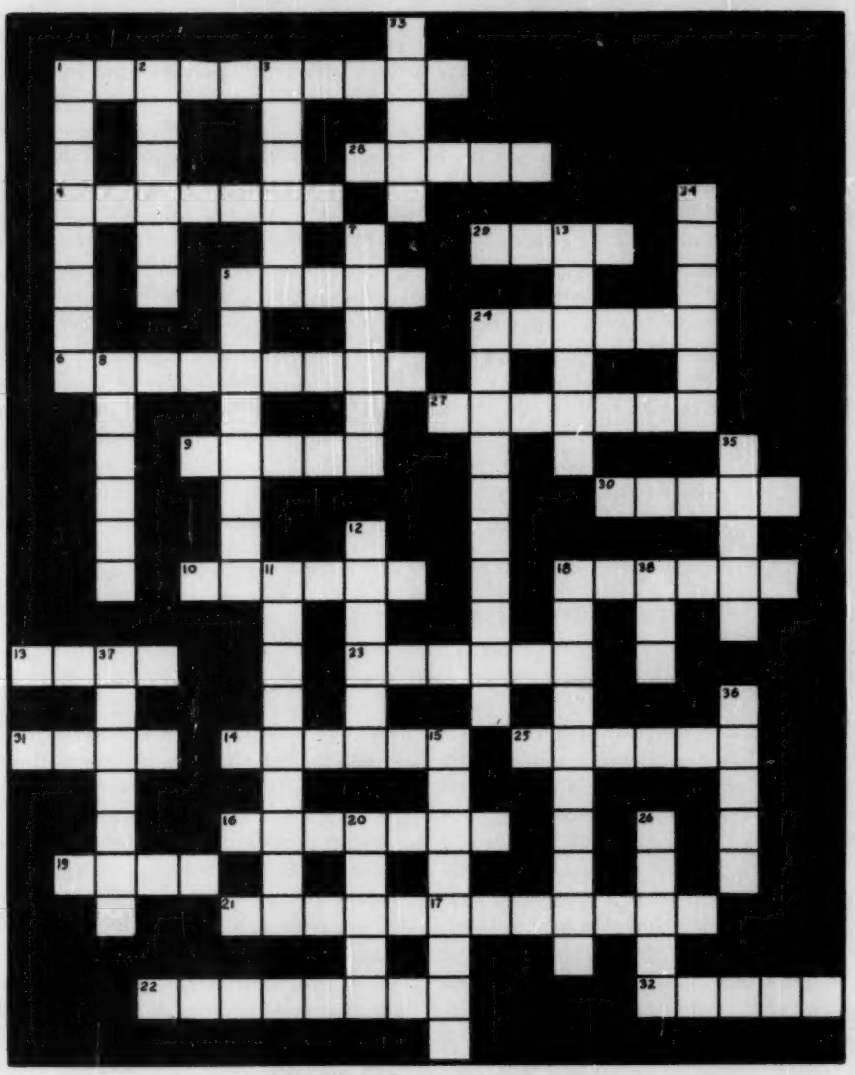
IN SPITE OF what many high school students think, the study of geography can be fun. Geography can be dull, routine, and lacking in direction if the student is required to memorize long lists of natural resources, products, population statistics, and production figures. However, the teacher who is trained in the modern approach to teaching will argue that his students should be exposed to sound concepts, not factual information, per se. The geography teacher is in wholehearted agreement with this belief. But the geography teacher, trained in his discipline, knows that mnemonics does have value, that there is a nomenclature to be mastered, and there are facts to be assimilated as an essential part of the student's geographic knowledge. Such materials help build the solid foundation upon which sound and meaningful concepts are built.

Intrinsic facts, terms, locations, and products can have meaning, and boredom will be allayed if teachers treat pertinent materials in a dynamic and vizualized manner. Specialists in geographic education have expounded this belief, and they have substantiated their arguments with a battery of valuable teaching procedures. An additional expedient which has been particularly effective in some classrooms is the geographic crossword puzzle.

The crossword puzzle can be an advantageous teaching device since its method and scope are known to all. Orientation to the use of the puzzle will be at a minimum. The student will associate crossword puzzles with fun, not study, and with leisure, not work. The

THE WORLD'S CAPITALS



THE WORLD'S CAPITALS

Name the capitals of the following countries

ACROSS

1. Denmark
4. Iraq
5. France
6. Netherlands (commercial capital)
9. Bulgaria
10. Cuba
13. Switzerland
14. Canada
16. Nicaragua
17. Ceylon
18. Poland
19. West Germany
21. Saudi Arabia
22. Chile
23. Greece
24. Monaco
25. Austria
27. Andorra
28. Tunisia
29. Norway
30. Jordan
31. Yemen
32. Japan

DOWN

1. Australia
2. Czechoslovakia
3. Cuba
5. Union of South Africa
7. Albania
8. Union of the Soviet Socialist Republics
11. Laos
12. Turkey
13. United Kingdom
15. Paraguay
18. United States
20. Ghana
24. Uruguay
26. Morocco
33. South Korea
34. Colombia
35. Bolivia
36. Liechtenstein
37. Burma
38. Brazil (Abbr. for old capital until 1960)

crossword puzzle should not be used as a test. True, it is a means towards evaluating the student's work, but once a formal grade is placed on the exercise, it loses its favorable appeal. The puzzle on "The World's Capitals" will serve as an illustration of what may be prepared for student distribution. Puzzles may range in content and scope from those emphasizing general political or physical features of the world to conservation topics, economic geography, or the treatment of a particular nation's geography. Topics for crossword puzzles are literally worldwide.

The building of a good crossword puzzle consumes a great deal of thought, initiative, and time. Obviously, the teacher has many professional obligations which will prevent him from embarking on an ambitious crossword puzzle program. After the class has used one or two teacher-constructed puzzles, students may be encouraged to construct their own puzzles. The teacher could reproduce the students' efforts by mimeograph for use by the entire class. Needless to say, the construction of crossword puzzles is an ideal activity for extracurricular geography clubs. The time should come when it would not be unusual for a study hall teacher to overhear one student querying another, "Say, Phil, what's a seven-letter word meaning 'the mouth of a river where fresh water and salt water mix?' "

DEVELOPING MAP READING SKILLS*

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If maps are to be used effectively in the classroom, it is essential that the students have a complete understanding of maps. The reader of a map must know that it is a "bird's eye view," drawn with lines, of a given area or section of the earth. This may be a relatively small area or it may include the entire surface of the earth. With few exceptions, a map is not a photograph nor is it a realistic view of the area represented (Fig. 1).

The skills required in reading maps should begin with children in the primary grades. There is great need for developing map reading readiness. The writer has observed first grade children working with and understanding simple maps that had been made in the classroom. "Map" is part of the vocabulary of six-year-old children. At times these children will draw checkerboard lines on drawing paper and describe their "map" with no prompting from the teacher or parent. This map reading experience is similar to word reading or picture reading experiences which children begin to have prior to entering the first grade.

Teachers must realize that map reading, like word reading and picture reading, is a developmental continuing process which requires several skills. It must be understood that all skills and understandings are not grasped during a single concentrated lesson on map reading. Many lessons and years of growth will be required for mastery of map reading skills.

The major concern of this article is in the area of understanding the types of maps used in the schools throughout the United States and Canada. The writer

* Reprinted from the September, 1960, issue of *Educational Screen and Audiovisual Guide*. We wish to thank the *Educational Screen and Audiovisual Guide*, Dr. Leonard H. Bathurst, and A. J. Nystrom and Company for their permission to reprint this excellent article.

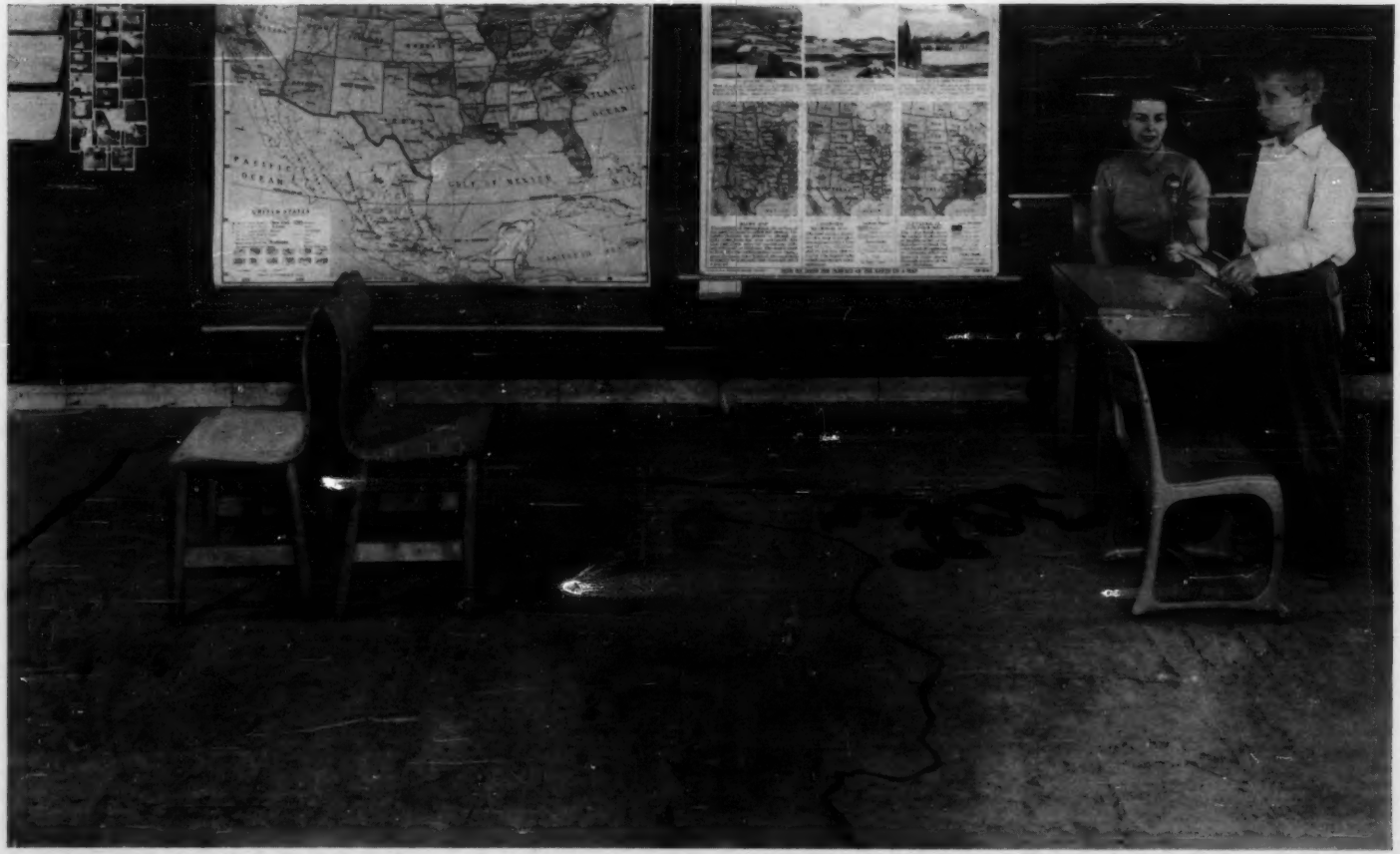

FIG. 1. These photos, provided through the courtesy of A. J. Nystrom & Co., illustrate steps paralleling those described in the story. Here, a more advanced class studies a "linoleum map" of the United States.

is not concerned at this point with the more specialized maps not normally used by students in school situations.

This proposed method of introducing map reading is based upon known facts about learning. Since the writer does not know each teacher's class (its capabilities, experiences, etc.) some variety may—at times necessarily—be entertained at the discretion of the classroom teacher in order to make his or her teaching more effective and interesting for the students.

Primary Grades

To first grade children, the school-home community is the world which they study and attempt to understand. This "world" is usually studied as a segment of their social studies curriculum. They will devote many hours studying and understanding this community.

The study of maps could, and perhaps should, commence during this first school year. The students take many excursions about the school grounds and the surrounding streets. These trips are considered an essential part of the reading readiness and social studies program. While the children are creating this common denominator, they may very well be preparing themselves for an introductory study of map making and understanding.

The teacher's responsibility would be to direct the attention of the children to the important sites that will assist the children when they begin map construction. Some of these sites would include the principal streets and avenues, service stations, prominent homes, traffic signs, fire stations, the post office, grocery stores, barber shops, mail boxes, open fields and lots and other "landmarks" in the community.

Along with discussions of these sites (not all at one time), directions and relationships would be observed and discussed in the classroom as well as in the field."

Colors are learned and used by the children. The many structures they see will have color (Bobby's home, the fire station, the stop sign, etc.). These colors will be used as the map is constructed and may help the children to remember the location of certain landmarks.

Map Construction and Use

In the spring of the school year, after many trips and discussions, the class should be ready to begin a map construction project. This social studies unit should be introduced as interestingly as any other unit. If the group is not yet ready for the project, the teacher should postpone the unit until a more suitable time.

Rather than waiting for the children to become ready, the teacher will be evaluating the class, plus his or her own techniques and weaknesses. Using the results of the evaluation the teacher should strive effectively to assist the children in gaining a deeper understanding of their school-home community.

The children would need to realize that because of the size of the real community it would be impossible to bring it into the classroom. The teacher might have the children name other objects which would be too large to bring into the classroom. The class would discuss symbols by which the objects could be shown in the school room. Photographs, models or drawings of these objects are brought to the schools to represent the real object. The teacher would explain that a map is a drawing or model of the area which it represents.

"We will make our map look as much like our community as we can," is the idea to have the students accept, desire and discuss.

During the discussions the group would be integrating the language arts and social living program into the map unit. Art abilities and small muscle skills would be required to construct the build-

ings of construction paper. Making signs, lettering streets, addressing homes, drawing pedestrian crosswalks, etc., will require skills which are being developed by these youngsters. Safety rules and habits may very easily fit into this unit. The proper way to cross a street, the shortest, safest way home from school, to the store, etc., may be practiced on the map and discussed in the class and out on the streets. Teaching boys and girls to observe is very important at any age level and is often neglected during the educational experiences of the children. The teacher would be expected to continue to teach good work habits and study habits while initiating this unit.

The next step, in this method of teaching map construction and reading, consists of setting aside a section of the classroom as the map corner. (An area approximately 9 × 12 feet on the floor may work very well.) Some first grades have a linoleum play area in their classroom. If such is the case, the reverse side of the floor covering (to eliminate distractions) may serve very well for the map. With a linoleum, the map has a natural boundary line which could be helpful.

After the teacher has planned the "layout" of the map in advance, the class, using chalk or tempera paint, would draw a street which would represent the street in front of the school building. The nearest intersection could then be drawn.

The streets on this floor map should be wide enough for the children to walk on without touching the buildings which will be placed on the map. (The width of the streets should be considered during the construction of the "homes" so that the scale is fairly accurate.)

After the first intersection is placed on the map, it would be feasible to place the school building on the proper site. This would provide a point of orientation from which the children could continue developing the map. The child living nearest the school could then place his "home" on the map. If it is necessary for him to cross a street, it may be important to draw in another street. The children would be visualizing the boy's actions because they know where he lives. The next child places his home on the map. Streets are added as the homes are placed on the map. Other buildings are placed in their relative positions.

It would be interesting and helpful to have the children actually walk down the street from the school. They turn left or right when they normally turn as they walk home. The children obey the traffic and safety rules as they walk down the streets on the map. This would also provide an opportunity for the teacher to observe the learnings of the pupils in a "play life" situation.

The names of the streets are written on the floor, intersections are lined with safety zones, traffic signs are placed at the proper intersections and other "landmarks" are put into position by the students.

Three Dimensions

After the map has been completed the students would walk up and down its streets describing their walk and the objects placed on the map. As they do this walking and talking, the map should become more realistic to them. When the students have learned the map, the teacher might have them make a three-dimensional map on a sand table. This would be more abstract than the map on the floor. Instead of walking up and down the streets, the children could have their fingers walk through the streets. The sand table would be much smaller, the streets much narrower, and the buildings very small. Small blocks of wood used in games such as *Monopoly* might be used—the small symbols for houses and the larger ones for the school, store, post office, etc. (Fig. 2).

The sand table map would be more ab-

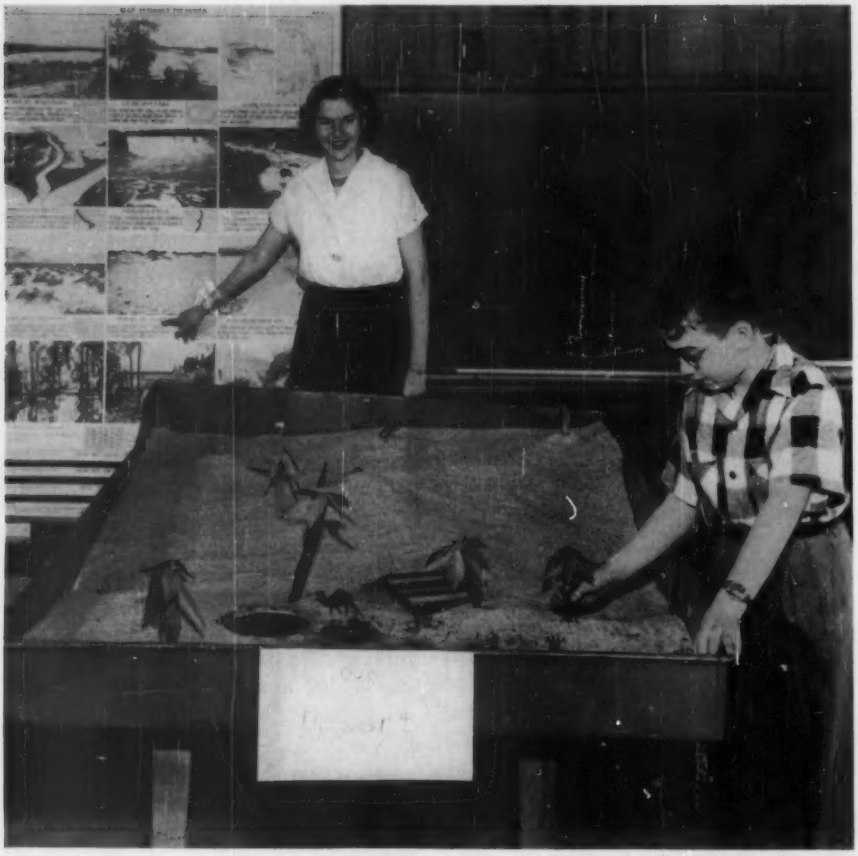

FIG. 2. When this class arrived at a study of the southwestern regions of our country they wanted to construct their own sand table desert, complete with small desert plants contributed by the local florist.

stract than the map on the floor but it would still have three-dimensions. The writer believes that this transferring to a smaller, 3-D map is rather essential in order to assure more complete understanding by all the children in the class. The map should be developed as slowly as necessary to have every child follow the abstracting. The floor map should remain until the unit is completed so that the children may go back to it for reassurances when necessary.

Vertical Map

After the children have walked through the map with their fingers several times, they may be ready to move to a more abstract level of understanding. That level would be presented on the chalk board. The map now leaves the horizontal plane and is presented on a vertical plane. It becomes more abstract because it is a series of lines drawn to represent the streets, signs, buildings, etc. If this is developed slowly by the students, there may be little or no difficulty involved. Nevertheless, the teacher must be certain that the students are understanding this transference from the three-dimensional horizontal model map to a two-dimensional drawn or diagrammatic map in a vertical position (Fig. 3).

FIG. 3. And fifth graders build their own 3-D table map to present a true-to-scale (almost) presentation of their community. he teacher is careful to confine his activities to that of passive overseer, answering questions as desired. Note the wall map used as guide.

The students should trace the routes home, to the store, post office and friends' homes on the drawn map many times, with the teacher observing each motion of the fingers. Questions, answers and discussions should be held to evaluate the learnings of the students. References would be made to the sand table map and the floor map as the occasion required.

Moving into the final phase of this elementary, home-school community map the teacher may wish to reduce the map to $8\frac{1}{2} \times 11$ inch paper for the children to take home. The writer believes this could be achieved by having the teacher attach an $8\frac{1}{2} \times 11$ sheet on the chalk board beside the larger map. While in full view of the children, the teacher would draw the outline of the map's main arteries on the sheet of paper. He or she would explain to the children that the map is being reduced, or made smaller, to fit that size paper. If one line is smaller, shorter, or narrower, then all lines must be made smaller, shorter, or narrower. He could draw the school and perhaps some other buildings or symbols for them on the map and have the students discuss them. Perhaps some of the

children could assist in placing them on the drawn reduced map.

In preparation for the next day's lesson, the teacher could duplicate enough maps so that each child would have two copies. On the first one, each child would trace his safe way home and place his home on the map. He could color his home, the school, store, etc. On the second map, each child could make a complete map showing the location of the homes of all the boys and girls in his class and all the important "landmarks."

This map construction could be a very real evaluation of his knowledge of map making and interpreting on an elementary level, as well as providing enjoyable problem solving.

In the years to follow, the child's understanding of a larger community (a larger section of town) would have developed. His small world has grown and he has gained some understanding of size relationship. A map of his city is made very similar to his own map, but a greater area is included. The study of maps continues from city to county, to state, to country, to continent, to hemisphere, and to the entire earth. As the child's community gets smaller in size relationships, his world of understanding, if developed properly, continues to grow, and, having an understanding of elementary maps, he can graduate to the study of more complicated maps.

GEOGRAPHIC CONCEPTS IN THE SPACE AGE

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THIS STUDY is confined to the elementary development of some concepts of scale, longitude, and latitude as projected into vertical space. This survey is limited to 100 pupils, 12 to 14 years old, whose scores on standardized mental and achievement tests were average or above that standardized for grade 8. A pretest revealed that at the beginning of grade 7 the pupils used scale for (1) measuring distance in miles between two places, (2) tracing distances of routes either real or imaginary and (3) estimating extent and areas. Twenty-five per cent of these pupils measured distances not only in miles but in time required to traverse or fly the distances at given speeds. Measuring distances in hours of flying or motoring time was readily adopted by all of the pupils.

Horizontal Scale

The concept of area as related to spatial arrangements and to distributions of population, cultural, and physical features in a given area required teaching and the repeated use of examples before the pupils could apply this concept in grade 7. Examples were first drawn from the local environment and related to number of people and/or features such as dwellings, commercial and working areas, schools, recreational land use, and transportation routes. These pupils found that in their own urban area the average population per square mile is approximately 14,000 persons, or an average of 20 person per acre. These pupils visualized the size of an acre as approximately the area of a football field. By making concrete comparisons, computations and observations of the locations and distribution of these local features in relation to each other, the pupils were able to make mental comparisons about other densely populated areas. They also asked why people do not live in many different places around the earth. On maps they observed less inhabitable areas

and the size of these thinly populated regions—sometimes described as environments that are too dry, too cold, or too high in elevation for habitation—and they also looked for factors which would place these areas on the frontier for exploration.

It was noted that when 7th grade pupils used a large and small scale map of any area, they would resort to fitting the area shown on the large scale map into the location of that area on the small scale map. This became a logical step for fitting aerial photographs into a map. These pupils sought multiple scale maps. For example they found it convenient to compare a map having a scale of 1 inch representing 50 miles with the 16 inch globe on which 1 inch represents 500 miles. The representative fraction was not used by these pupils until they were faced with the problem of projecting a scale vertically into space from a horizontal scale of distance.

Vertical Scale

Vertical scale requires that concepts of the horizontal scale be projected vertically in order to visualize distances and extent into space. The class first used a three dimensional map, with an exaggerated vertical scale 20 times that of the horizontal scale. There was little evidence to show that 12 year old pupils, who have never actually experienced traveling or living on high hills and mountains, comprehended vertical scale in relation to horizontal scale on the map. However, with practice, an increased awareness of variations of elevation and slope in relation to drainage to the sea and as covered by different horizontal distances was developed. Ninety-six of the 100 pupils traced a river from its mouth, upstream, rather than from its source, downstream. The use of contour maps showing elevations measured in feet or meters above sea level added to the pupil's experience which helped him visualize slope and drainage in the real environment.

Now that the class showed an awareness of vertical scale as applied to the earth's surface and landforms, the concept that "under normal conditions there is a general *decrease* in temperature with *increasing* elevation"[1] was introduced. "Although the rate is not uniform, . . . , the average is approximately 3.3° F for each 1,000-ft. rise."[2] The pupils also discovered in their reading that, as air ascends through the atmosphere toward outer space, the ascending air's temperature drops at the average rate of 5.5° F unless precipitation occurs. When precipitation takes place the rate of cooling decreases because heat is released.

This application of vertical scale to the atmosphere in relation to temperature changes motivated the more curious pupils to look for other phases of atmospheric conditions. They soon discovered they could not project any data without carefully checking scientific literature. They learned to appreciate the use of two scales in the same chart—one a horizontal scale and the second a different scale unit for the vertical scale.

The pupil's ability to visualize distances as read from the printed text was checked by problems such as the one which follows.

The sun is 864,400 miles in diameter. The earth is approximately 93,000000 miles from the sun. The earth's moon is 240,000 miles away. Can the sun be placed between the earth and the moon?

About 20 per cent of the pupils were unable to visualize this impossibility until they made a diagram to scale. Using the scale of one-eighth inch represents 8000 miles, the sun was approximately 13 inches in diameter. The distances be-

[1] Vernor C. Finch and Glenn T. Trewartha, *Physical Elements of Geography*, McGraw-Hill Book Company, Inc., New York, 1949, p. 37.
[2] *Ibid.*

tween the earth and the moon on the same scale was approximately three and three-eighths inches. To these 12 to 14 year old pupils, preparation of diagrams and charts to scale became concrete lessons in which they discovered and could visualize comparative relationships involving scale.

The calculating of scale in order to see relationships of distances motivated a curious pupil to comment, "If light travels at the speed of 186,000 miles a second and it is 25,000 miles around the earth, traveling with the speed of light I would go around the earth seven and one-half times in one second. Is it speed that really takes man into outer space?"

Motion of the Earth

When these pupils projected distances and speed into outer space they asked many questions concerning the motions of the earth through space. The geography classroom presented an opportunity to help pupils apply and use the basic concepts of longitude and time, latitude and sun behavior.

The rotation of the earth from west to east each 24 hours called for the converting of distances between two longitudes into miles at different latitudes.[3] After learning that it requires a minimum speed of 7 miles a second or 420 miles a minute, or a speed of 25,000 miles an hour (the distance around the earth), the pupils raised questions concerning the speed of the rotation of the earth at different latitudes. When the pupils observed on the globe that the distances between any two 15° of longitude is the distance the earth rotates on its axis in one hour, and that the distance the earth moves becomes less with increased latitude (for example the distance is twice as much at the equator as it is at 60° north or south latitude), the advantage of launching a satellite near the equator became more significant. The class discovered it could demonstrate that there is a "bonus toward escape velocity" by rotating a globe or wheel on a fixed axis.

The revolution of the earth around the sun, once every 265¼ days from season to season was illustrated by using a light bulb to represent the sun and four small globes to show the position of the earth for September, December, March, and June. The pupil then turned to a 16 inch globe, used as a symbol for the earth, and checked the analemma[4] for the latitude where the noon sun position is seen directly overhead from day to day, and month to month.

All of the pupils were taught to adjust a globe equipped as a free moveable ball in a cradle with a hinged Great Circle.[5] The globe was adjusted so that "up" was directly overhead for whatever place selected. When the globe was "erectified," the noon sun read from the analemma, and followed along that latitude on the globe, the pupils discovered they could estimate the angle of the noon sun and could count the number of hours of daylight and the number of hours of darkness for any place on the earth and for any day of the year. The pupils used this information of latitude and sun behavior and observed and demonstrated with the globe and a light the direct rays of the high noon sun over the low latitudes and the long slanting rays of the sun in the high latitudes. This gave one pupil an interest in locating the position of the Van Allen Radiation Belt over the globe. A number of questions were discussed when one of the pupils brought in this quotation from Dr. von Braun: "The Van Allen Radiation Belt may

[3] Ruby M. Harris, *The Rand McNally Handbook of Map and Globe Usage*, Rand McNally Co., Chicago, 1959, p. 77.

[4] *Ibid.*, p. 147.

[5] Ruby M. Harris. *The Rand McNally Handbook of Map and Globe Usage*. Rand McNally Co., Chicago, 1959, pp. 151-160. (Adapted from The Hinged-Horizon Globe Mounting—What It Is and How to Use It, by Carl H. Mapes.)

prove to be one of utmost practical importances for many things on Earth."

By adjusting and rotating the globe beneath the hinged circle, the class learned to see the relationship of any place on the earth in relation to any satellite in orbit around the earth and could demonstate this orbit.[6]

Conclusion

In conclusion this study suggests that teachers in the classroom need more research on how pupils learn and how they translate into use skills for observing relationships that involve geographic concepts such as scale, longitude, and latitude when learning about space relationships. This study suggests some of the problems encountered by 12 to 14 year old pupils when they need to use concepts of scale that involve horizontal and vertical relationships and basic understandings of the motion of the earth as they pertain to longitude and latitude.

Although many sources were used by class and teacher, the following have been especially useful:

1. Harris, Ruby M. *The Rand McNally Handbook of Map and Globe Usage.* Rand McNally Co., Chicago, 1959. Although written for teachers, junior high pupils find many of the answers to questions on how to use the globe and maps in this book. Directions are clear and concise.

2. National Academy of Science—National Research Council. "Planet Earth (The Mystery with 100,000 Clues)." 2101 Constitution Avenue, N.W., Washington 25, D.C. This material consists of six large posters entitled: "Earth," "The Ocean," "The Poles," "Weather and Climate," "Sun and Earth," and "Space." Booklets explaining the details on the posters are available. Approximately $10.00.

3. American Education Publications. *Our Exciting Universe; Science Explores our World* (A report on IGY discoveries in 12 fields), and *Weather and You.* Address Education Center, Columbus 16, Ohio.

4. Changing Times. *The Exploration of Space.* Changing Times Reprint Service, 1729 H Street, N.W., Washington 6, D.C., January, 1960.

[6] Ruby M. Harris. *The Rand McNally Handbook of Map and Globe Usage.* Rand McNally Co., Chicago, 1959, pp. 149-150, "Tracing the Route of a Satellite."

THE NATIONAL COUNCIL AT WORK

Geographic Education: A Rising Tide

Evidence from many quarters indicates that geography is gaining greater recognition in our country. At a recent state education meeting a newspaper reporter was assigned to cover a particular section because, as the reporter explained, "A geographer was to speak to this meeting." The latest Conant report—this one on the junior high school—lists social studies, with specific reference to geography and history, as basic studies. Membership in the National Council for Geographic Education and subscriptions to THE JOURNAL OF GEOGRAPHY are at an all-time high. Other examples of rising interest in geography might be cited.

The explanation of increased interest in geography, though of interest to all geographers, is not my major concern. Long ago I discontinued requiring my students to respond to the question, "Why are you enrolled in this course?" I soon learned that, by and large, their reasons bore little relation to those qualities that I possessed, or fancied I possessed, as a teacher. Now I accept each student, caring little for his reason for enrolling, and endeavor to help him make the course a valuable experience.

I suspect that the reasons for increased interest in geography lie largely outside the profession itself and bear little direct relationship to the efforts of those who have been working to further geographic education. This is not to discourage us but to suggest that we do not employ too much of our effort in analyzing this fortuitous circumstance. I suggest, rather, that we accept it as a healthy development in American education and focus our attention on the question, "What are we going to do with the opportunity now before us? How are we as geography teachers going to speak to this growing national audience?"

I am encouraged as I contemplate the possibilities for geography in the years ahead. The efforts of workers in geographic education and

research may now begin to yield a greater harvest. Geography teachers today have access to a greater wealth of useful materials than ever before. And it is my opinion that American geography now stands on firmer philosophical footing. What this really means is that workers in geography today have at their disposal the best tools the profession has ever afforded.

This constitutes an exciting challenge—the challenge to become a better geographer, to become a more inspiring teacher, and to become a stronger supporter of our professional organizations. May I ask, in particular, that you pledge a reasonable measure of your time and thought to the NCGE. Many different and important tasks are to be done during 1961. With your dedication to geographic education and your cooperation with the leadership of the NCGE, we will be able to speak with greater clarity and greater confidence to the geography teacher's growing audience. We can be assured that we will continue to advance along our sector of the educational frontier.

JEWELL PHELPS, *President*

EDITORIAL NOTES AND NEWS

On January 1, 1961, when the *regular membership* dues will be increased to $5 a year, contributing membership dues will remain at $10 a year. The Executive Board has voted to send contributing members copies of all Leaflets, Professional Papers, Special Publications and "Do It This Way" series published during the year. Dr. Kennamer, Secretary of the National Council for Geographic Education, has supplied the following list of *1959 Contributing Members.* (If your name should have been listed but was accidentally omitted please write to Dr. Lorrin G. Kennamer, Chairman, Department of Geography, University of Texas, Austin, and we will run a second listing):

Anderzohn, Mamie Louise
Austin, Maud N.
Bacon, Phillip
Baker, Emily V.
Barton, Thomas F.
Bershlag, George
Black, Lloyd D.
Bohn, Viola M.
Botts, Adelbert K.
Brooks, Nathan C.
Buell, Irma A.
Carls, Norman
Casper, Berenice M.
Cooper, Allene S.
Corfield, George S.
Cowan, Corrine
Cressey, George B.
Cullin, Florence
Cunningham, Floyd F.
Dragon, Rosaline Gross
Eiselen, Elizabeth S.
Flemington, Adah
Funderburk, Robert S.
Garland, John H.
Goodman, Robert J.
Gross, Herbert H.
Grosvenor, Gilbert H.
Hamlin, George H.
Hanson, Frances M.
Hubbell, Herb
James, Preston E.
Jennings, Charles W.
Kennamer, Lorrin G.
Kimber, George C.
Koch, G. David
Kohn, Clyde F.
Kohn, Doris M.
Lobo, Oswaldo Castro
McConnell, Wallace R.
McGirr, Mabel L.
Maddox, Joseph T.
Melezin, Abraham
Meyer, Alfred H.
Montgomery, Katherine
Morris, John W.
Moser, Mrs. Paul D.
Nielsen, Elisabeth S.
O'Kelley, Cora E.
Parker, Edith P.
Pearson, Ross N.
Phelps, Jewell A.
Phillips, Mary Viola
Raffel, Martin H.
Ramsaur, Robert T.
Scarfe, N. V.
Shaw, Earl B.
Sletten, Cora P.
Starkey, Otis P.
Stephenson, Glenn Van
Stout, Cyril L.
Stroup, John I.
Svec, M. Melvina
Thralls, Zoe A.
Van Cleef, Eugene
Weiner, Robert S.
Whittemore, Katheryne Thomas
Winslow, David C.
Zink, Norah E.

If you wish to be listed as a *contributing member* during 1960 and/or 1961, you can still write Dr. Kennamer.

Dr. Benjamin Richason, Carroll College, Waukesha, Wisconsin, has been elected chairman of the newly formed Wisconsin Council for Conservation Education. This group is composed of college professors, public school superintendents, principals, and teachers, and representatives of conservation clubs, service clubs, women's clubs, Wisconsin State Conservation Department, and Boy Scouts.

Do you receive *Resources*, published three times a year by Resources for the Future, Inc., 1775 Massachusetts Avenue, N.W., Washington 6, D.C.? If you are a college or university teacher of a conservation course, you will find this 4-page publication useful. Two quotations from the September, 1960, issue follow:

> Resources are living phenomena, expanding and contracting in response to human effort and behavior.—Erich W. Zimmermann in *World Resources and Industries*
>
> Conservation no longer expresses a self-contained and self-justifying purpose; resources have become means to ends as diverse as growing proteins, living urbanely around cities, and winning international security.—Henry C. Hart in *Perspectives on Conservation*

During recent months, iron and steel companies have been pushing ahead with plans for expanding and improving their production facilities, despite the fact that operations were at reduced rates.

More than a dozen announcements in July and August indicated that company executives are going ahead confidently with their planning. Knowing that the pace of industrial activity must inevitably rebound, the companies were aiming to improve their products and customer service, meet competition and become more versatile and efficient. None wanted to stand still, and thus lose ground (October, 1960, *Steel Facts*).

The following publications pertaining to forestry and agriculture have recently been released:

> "Forest Industry Opportunities in Rural Development." Forest Service, U. S. Department of Agriculture, Washington 25, D.C.
>
> "How Can the Nation's Forests Best Serve the American People?" American Forest Products Industries, 1816 N. St. N.W., Washington 6, D.C. Talk by Henry J. Vaux, dean of the School of Forestry of the University of California, Berkeley, California, made at a meeting of AFPI trustees in San Francisco.
>
> "An Appraisal of Agricultural Research—and the Road Ahead." Agriculture Information Bulletin No. 221, Office of Information, U. S. Department of Agriculture, Washington 25, D.C. Contains section on forestry research.

No. 1, Volume 39 of *Geographical School Bulletin* has been received and it contains the usual excellent material. The No. 1 issue of Vol. 39 started with the October 3, 1960, publication. I am sure that if your school isn't getting it, you should consider getting it. It is published by the National Geographic Society, Washington 6, D.C. The cover of the issue shows a "Peking girl" learning A B C's as Communists work to replace China's complex ideographs with Westernized letters."

Interest Stimulating Device

Everyone can sharpen his observation of details of the phenomena of nature and geographic aspects of various events. To write an orderly, logical description and interpretation of these observations makes an assignment that brings exciting results. The originality of the titles of such compositions can be amusing and intriguing. The lengths to which imagination soars adds to the fun of the assignment.

One such project early in the fall semester was to write a description and interpretation of something that had been experienced, seen, heard, or read about during the summer—with a geographic flavor, of course. Some of the self-explanatory headlines were:

> Frost Nips Pocketbooks
> Here Comes Brenda

The National Academy of Sciences-National Research Council will conduct, in 1961, under the financial sponsorship of the Office of Naval Research, its sixth annual program of geographical field research in foreign areas. During the first five years awards have been made to forty-five young Americans to conduct field research in topics of their own choosing for periods ranging up to twenty-four months. The objective of the program is

to strengthen American Geography by stimulating greater participation by young Americans in field research in areas outside of the English-speaking areas of North America. Alaska, Hawaii, Canada, Bermuda and the Bahamas are specifically excluded. The program is very broad in scope: it includes all branches of geography as well as fields which are closely related to geography. Applications in the fields of physical geography are specially encouraged. The program is designed primarily for graduate students who wish to conduct field research in connection with their doctoral dissertations, but recipients of the doctorate within the last few years are also eligible. More mature scholars may submit research proposals to the Geography Branch, Office of Naval Research, Washington 25, D.C. Applications for support of field work which is to be initiated before April 1, 1962, must be submitted prior to December 1, 1960.

Miss Sandy Ghere, Lafayette Jefferson High School (Indiana), wrote the following short item entitled "Children's Books Old, Dull; I.U. Prof. Has New Plan." We believe that readers would be interested in her report.

"Stories about spaceships, cowboys and Indians, and matters of real interest are probably what most six to seven-year-olds would rather be reading than 'Go, Spot, Go,' said Dr. Ruth G. Strickland, professor of Education at I.U.

"Dr. Strickland has been working about a year and a half on the theory that children's elementary reading books are outdated and often boring. She is working with several linguists and her experiments are being financed by the United States Office of Education.

Speech is Reading Factor

"Dr. Strickland says, 'The skill with which a child learns to read will be based upon his use of the oral language.' About 800 Bloomington children have had recordings made of their free conversations. These recordings have been analyzed by a formula devised by Dr. Strickland and the linguists to determine whether or not television, travel, modern communication, and variety in children's books affect the maturity of a child's speech and his ability to learn to read.

"The spoken language is analyzed for sentence length, sentence structure, patterns of word usage, and the rhythm and flow of their speech. These findings are then related to the child's age, sex and intelligence. Later, recordings will be made of pupil's oral reading. The problem, then, will be to compare the language which they commonly speak with the material they are taught to read in school.

Current Books Too Dull

"It is Dr. Strickland's belief that the language used in today's elementary reading books is boring to many first and second grade students. 'The faster students are bored reading the same thing over and over again while they are waiting for the slower ones to catch up.' Although no conclusions can be drawn as yet, it seems that six and seven-year-old children can use all the kinds of sentences adults can use. They may not be constructed as well, but some can use all kinds, said Dr. Strickland.

"Evidence seems to point to the fact, too, that girls tolerate primary reading material better than boys. Dr. Strickland hopes, if the findings of her research turn out as she believes, that the material in the primary reading books will be increased in interest and offer more of a challenge for the youth who is learning to read."

GEOGRAPHIC MATERIALS RECEIVED

Inez Hogan. **Little Lost Bear.** E. P. Dutton and Company, Inc., New York, 1960. $2.50.

Kenneth W. Olm and Sandra Richard. **Equipment Replacement Policies Among Selected Texas Banks.** Bureau of Business Research, The University of Texas, Austin, Texas, 1960. 56 pages. $1.50.

Arvid A. Anderson. **Marine Resources of the Corpus Christi Area.** Bureau of Business Research, The University of Texas, Austin, Texas, 1960. 49 pages. $1.50.

Pauline Arnold and Percival White. **Homes America's Building Business.** Holiday House, 8 West 13th Street, New York 11, New York, 1960. 379 pages including index, table of contents, photographs. $4.50.

Guy Piazzini. **The Children of Lilith.** E. P. Dutton & Co., Inc., 300 Fourth Avenue, New York 10, New York, 1960. Translated by Peter Green. 192 pages with illustrations. $5.95.

George B. Cressey. **Crossroads.** J. B. Lippincott Company, East Washington Square, Philadel-

phia 5, Pennsylvania, 1960. 593 pages with illustrations, maps, index, table of contents. $8.95.

Educators Guide to Free Tapes, Scripts, and Transcripts. Educators Progress Service, Randolph, Wisconsin, 1960. $5.75.

Peter Quennell and Alan Hodge. **The Past We Share.** G. P. Putnam's Sons, 210 Madison Avenue, New York, New York, 1960. 308 pages. Illustrated. $12.50.

Dickinson Weber. **A Comparison of Two Oil City Business Centers (Odessa-Midland, Texas).** University of Chicago, Chicago, Illinois, 1958. 239 pages. $4.00.

Lawrence Durrell. **Prospero's Cell.** E. P. Dutton & Company, 300 Fourth Avenue, New York 10, New York, 1960. 198 pages. $5.00.

N. E. Lee. **Harvests and Harvesting Through the Ages.** Cambridge University Press, 32 East 57th Street, New York 22, New York, 1960. 208 pages with illustrations. $2.95.

John C. Caldwell and Elsie F. Caldwell. **Our Neighbors in India.** The John Day Company, Inc., 210 Madison Avenue, New York, New York, 1960. 48 pages with illustrations. $2.00.

R. J. Harrison Church. **West Africa.** Longmans, Green & Company, Inc., 119 West 40th Street, New York 18, New York, 1960. 547 pages. $10.00.

Elizabeth S. Helfman. **Water for the World.** Longmans, Green, and Co., Inc., 119 West 40th Street, New York 18, New York, 1960. 213 pages. $3.75.

International Labor Office. **International Migration, 1945-1957.** International Labor Office, Washington Branch, 917 15th Street, N.W., Washington 5, D.C., 1960. 414 pages. $4.00.

S. W. Wooldridge and R. S. Morgan. **An Outline of Geomorphology.** Longmans, Green & Company, Inc., 119 West 40th Street, New York 18, New York, 1959. 409 pages with table of contents, list of illustrations, etc., and index. $6.50.

T. C. Fairley. **Sverdrup's Arctic Adventures.** Longmans, Green & Company, Inc., 119 West 40th Street, New York 18, New York, 1960. 305 pages with table of contents, illustrations, and index. $6.00. Adult.

Arthur H. Robinson. **Elements of Cartography.** John Wiley & Sons, Inc., Publishers, New York, 1960. 343 pages with index, table of contents, illustrations.

W. Gordon East and O. H. K. Spate. **The Changing Map of Asia.** E. P. Dutton and Company, Inc., 300 Fourth Avenue, New York City, New York, 1958. 434 pages with table of contents, introduction, index. Illustrated. $6.50.

Ralph W. Andrews. **Heroes of the Western Woods.** E. P. Dutton & Co., 300 Fourth Avenue, New York 10, New York, 1960. 192 pages with index, table of contents, and illustrations. $3.50.

BOOK REVIEWS

T. C. Fairley. **Sverdrup's Arctic Adventures.** Richard Clay and Company, Ltd., Bungay, Suffolk, Great Britain, 1959. 296 pp. Illustrated. $6.00.

Sverdrup's Arctic Adventures is an adaptation of *New Land: Four Years in The Arctic Regions* written by Otto Sverdrup, an English translation of which was published in 1904. This abridged adaptation of Sverdrup's *New Land* is a welcome addition to the growing works on exploration and historical geography of the Arctic. The author contributes two sections to the book which are valuable in interpreting Sverdrup's four-year stay in what ultimately became Canadian territory. It is fortunate that the author is a Canadian because he has been able to contribute valuable background information about the establishment of claims by the Canadian government for the areas Sverdrup discovered for his beloved Norway. The prologue briefs the reader on Sverdrup's life prior to his epic stay in the Sverdrup Islands. The epilogue is a valuable analysis of Sverdrup's later life as it related to his polar explorations and especially the Sverdrup Islands; it reveals the role Sverdrup played in the dispute between Canada and Norway and the way the settlement was engineered. Also included in the new book are eight pages of specially prepared maps. In additions, there are some air photographs which give the reader further insight into the nature of the land Sverdrup explored and mapped. The maps are difficult, however, to key into one's reading of the narrative. It seems that the reader is not always quite sure just where the journey being described takes him.

Nonetheless, the book is well worth reading by anyone interested in the geography of the north and particularly in details of the daily life of the explorer enduring the hardships of the harsh environment of the Archipelago of northern Canada.

DALIAS A. PRICE

Eastern Illinois University

Jack Steffan. **Mountain of Fire.** The John Day Company, Inc., 62 West 45th Street, New York 36, New York, 1959. 191 pages with pictorial map, table of contents. $3.50.

One of "Your Fair Land Series," the locale of this dramatic story is the region where the northern Sierra Nevada merges with the volcanic Cascades—specifically, the forested slopes of the sleeping volcano, Lassen Peak. This area

was the summer home of the Atsugewis who shared the forests and meadows with Maidu and Yana, native tribes who dwelt peaceably on the slopes of "The Mountain." Dependent on a simple food-gathering economy, they lived by fishing, hunting, and the collection of roots and seeds. These tribes were undisturbed until the 1850's when gold seekers and migrating home seekers searched out mountain passes leading to west-slope mining areas and the flat lands of the Sacramento Valley. Contact between Indians and White inevitably resulted in clashes.

The author skillfully develops the story of the natives living in peace among themselves, then suddenly placed on the defensive by the arrival of aggressive white men. In the eventual struggle, the simple Indian is no match for the gun-carrying White. Steffan's handling of the background material—geographical and historical—is accurate and vivid and the story is plausible and interest-sustaining.

This book will appeal to young people of junior and senior high school age, and to adults as well. It is a well-told, thrilling story of an important trail opened by intrepid migrants to the West, and their contact with the native peoples whose lives were closely bound up with slumbering Lassen, "Mountain of Fire."

RUTH E. BAUGH

University of California
Los Angeles

Alfred Lansing. **Shackleton's Valiant Voyage.** Whittlesey House, McGraw-Hill, 330 West 42nd Street, New York 36, 1960. 221 pages with preface, table of contents, and photographs. $3.95.

Shackleton's Valiant Voyage, by Alfred Lansing, describes the explorer's Odyssey from the time the order to abandon the ship *Endurance* at five in the afternoon of October 27, 1915, until Shackelton's arrival at the whaling station on South Georgia Island in the afternoon of May 10, 1916. The book, a shorter version of the author's fully detailed *Endurance,* differs from the latter in that the lengthy historical background was omitted.

Written after considerable research, mainly from diaries of expedition members, the book is a story of courage, hardship, and fortitude. When the *Endurance,* beset by crushing ice and adrift, was finally abandoned, 28 men were forced onto the ice with no means of communication with the outside world. With three small boats, dogs, and limited supplies, they began a desperate journey to civilization, travelling partly over ice floes in constant danger of breakup and open leads. The party arrived at Elephant Island. Most of the men had to stay there, and only Shackleton with three others made the final desperate dash in an open boat through the dreaded Drake Passage, with its wild seas and violent storms, to reach South Georgia Island.

Written in a dramatic and self-identifying style, this book should become a favorite of the 10 to 15 set who revel in adventure stories.

FRANCIS E. ELLIOTT

Cornell University

Mary Foley Horkheimer and John W. Diffor, editors and compilers. **Educators Guide to Free Filmstrips.** Educators Progress Service, Randolph, Wisconsin, 12th Ed., 1960. 125 pages and indexes. $6.00.

This volume is devoted entirely to listings of free filmstrips and free slides. The 12th edition lists 586 filmstrips and 38 sets of slides; motion pictures are not included. A number of the filmstrips listed have accompanying commentary on records. Certain ones may be retained permanently.

In addition to 52 titles listed under Geography, others under Agriculture, History, Science, and Transportation may be useful to geography teachers.

Accompanying each listing is a brief annotation which describes the content of the filmstrip, gives the number of frames or running time if it is sound, and the name of the issuing agency. A "Source and Availability Index" explains terms for borrowing and gives addresses of centers from which films may be borrowed.

This volume is a basic publication of this type. Its widespread use for more than a decade commends it as a source of instructional materials.

JEWELL PHELPS

George Peabody College

Sabra Holbrook. **Aluminum from Water.** Coward-McCann, Inc., 210 Madison Avenue, New York, 1960. 121 pages with photographs, maps, diagrams, glossary, and index. $2.75.

The men who put rivers to work making electric power because of younger men who put electricity to work making aluminum are the "heroes" of this recent addition to the "Challenge Books" group. Skillful interweaving of words and pictures give vitality to the people associated with creating Canadian riverpower—families as well as workmen—and emphasize the power potential of rushing rivers and latent lakes. Only the maps are less than excellent in guiding the reader easily through the Laurentians and British Columbia coastal mountains.

The first three chapters concentrate on construction of a new powerhouse at Chute-des-Passes, on the Peribonka River of northeastern Canada, to portray both the magnitude of the task and the methods that achieve success. Yet a boy's Saturday chores are granted a proportionate share of description along with how the million-horsepower installation functions. Chapter four displays the technical ingenuity required to build and maintain a transmission line over glacier-filled Kildala Pass in western Canada. In chapter five, the history of simultaneous discov-

eries, in Ohio and France, of electricity as the practical agent to refine aluminum cheaply establishes the reason for men's efforts at Chutes-des-Passes and Kildala. The final chapter makes brief visits to tropical and arctic lands that supply bauxite and cryolite for the electric furnaces in Canada.

Aluminum from Water should be pleasant and even exciting reading for 10 to 15-year-olds. At the same time, it unquestionably can teach many fundamental facts and relationships about hydroelectric power and the aluminum industry.

GEORGE M. HOWE
The Travelers Research Center
Hartford, Connecticut

Arthur N. Strahler. **Physical Geography.** John Wiley and Sons, Inc., New York, 1960. 534 pages with photographs, tables, graphs, bibliography, and index.

The second edition of Strahler's *Physical Geography* is well-timed to meet the recent, cold-water stimulated interest in the earth sciences. This well-known work has been significantly revised through reorganization and the addition of new chapters and topics. The illustrations have been improved visually and the fine photographs improved through enlargement and better reproduction. The excellent exercises and review questions accompanying each chapter are continued.

Part One, "The Earth as a Globe," is essentially unchanged although improved by reorganization and by the consideration of new topics such as the Transverse Mercator projection.

Part Two, "Weather Elements," has been strengthened by the treatment of new topics such as local winds, temperature-humidity index, the jet-stream (a very brief treatment), and a new chapter on Ocean Waves, Currents, and Ice.

In Part Three, Strahler has had to recognize the dominance of the Köppen system or modifications of it in geographical literature. Although holding fast to his explanatory-descriptive system of climate classification as being superior to the empirical Köppen system, he has incorporated the Köppen symbols and climate names into the climate chapters and has, therefore, eliminated the major objection to the first edition.

Part Four, "Landforms," has been improved by an expanded treatment of rocks, the addition of a table of geological history (not discussed), and the greatly expanded treatment (new chapters) of surface and groundwater phenomena.

This excellent text is commended to the profession with the anticipation that it will continue to find wide acceptance as an introductory text in Physical Geography.

WILLIAM R. BRUECKHEIMER
Western Michigan University

Richard J. Ward and Lawrence A. Hoffman (editors). **Readings in Economic Geography from Fortune.** Henry Holt and Company, New York, 1960, 130 pages. $1.50.

The editors have performed a most useful function in gleaning material which has special relevance to world economic geography from the pages of *Fortune* in the period since 1950. Six major sections, dealing with Climate and Agriculture, Minerals and Resources, Regional Economic Geography, Transportation, Industrial Location, and Economic Growth: The Future present well-written articles of real interest.

The editors have selected articles designd to pique the interest and whet the appetite of the student, professor, and layman. Crispness of style and pungency of expression encountered in the selections is a refreshing change from the pedantic articles often appearing in professional journals.

Readings in Economic Geography from Fortune is well designed as supplementary reading for an economic geography, resources, or commodity production course. In addition, however, the material is refreshing enough to interest the man in the street as well as the student. The publication is heartily recommended for its designed supplementary function, and it serves a multiplicity of tangential purposes as well. The current nature of much of the material is an especially laudatory feature.

ARTHUR H. DOLRR
University of Oklahoma

Robert S. Kerr. **Land, Wood and Water.** Fleet Publishing Corp., 230 Park Ave., New York 17, N.Y., 1960. 380 pages. $4.95.

Kerr's book deals with "nature's gifts for life and survival, man's hope for future progress." It presents popularly much of interest concerning land, wood and water, their great importance, and some ways in which they can be more effectively used.

Senator Kerr was born in a cabin in eastern Oklahoma, was elected governor with the help of his dramatic emphasis upon the great importance of land, wood and, especially, water to the people of Oklahoma. As a U. S. Senator since 1949 he has stressed the need for wiser use of water.

This is a distinctly readable book in which most American teachers, students above the lower grades, and adults will find considerable of interest. The dramatic presentation of some consequences of too little or too much water have wide appeal. In addition to considerable autobiographical material, biographical sketches are presented attractively of a score of American leaders in conservation, including John Wesley Powell, George H. Maxwell, Senator George W. Norris, Senator Allen J. Ellender, Henry G. Bennett, Hugh H. Bennet, and several less widely known people. The Tennessee Valley Authority project receives considerable attention as does his pet project, "The Kerr Plan," for the Arkansas River and its tributaries.

The bibliography is extensive and valuable. "Acknowledgments" reveal that Senator Kerr was assisted in writing this book by several competent persons, including John K. Rose, senior specialist in National Resources and Conservation, Library of Congress, who is a Ph.D. in geography.

This book is a worthy addition to the libraries of almost all who read this review.

STEPHEN S. VISHER

Indiana University

Peter Buckley. **The Spanish Plateau.** Coward-McCann., Inc., 210 Madison Avenue, New York, 1959. 95 pages with pictures, maps, table of contents, and index. $2.50. Ages: 10-15.

This book presents a somber picture of the meseta, the Spanish plateau.

If you plant a tree, the roots dry up.
If you dig a well, the water disappears.
If you care for a bird, the bird dies.

The above quotation from the book accents some of the crucial problems of the plateau. There is too little rain. In many areas erosion has already destroyed the unprotected top soil. Crops are small. People are poor.

The author recounts the circumstances of the past, noting how the Romans built aqueducts and how the Moors dug irrigation canals. The drabness of the contemporary is documented in text and photography. Hopefully the author looks ahead to more irrigation and more industry as avenues of improvement.

Altogether this is a valuable introduction to land and life in Spain. The author is a professional photographer as well as a writer. His selection of pictures will delight most geographers. We need more books combining high quality text with equally good photographs.

C. W. SORENSEN

Illinois State Normal University

Lillian J. Bragdon. **The Land and People of France.** J. B. Lippincott Company, Philadelphia and New York, 1960. 125 pages, photos, one map, table of contents, and index. $2.95.

The Land and People of France is a highly romanticized account of the history of this western European nation. The small amount of geography included is superficial and often misleading. Although the text makes for interesting and easy reading, it hardly offers an insight into the complexity and problems of a once great nation. It is not the type of book which presents academic gristle for the minds of American and Canadian teen-agers studying in today's challenging world.

The book is hampered by a lack of maps of both an historical and geographical nature. There is one map of place names which has very confusing natural boundaries and no scale. The book was revised in 1960 however, the photographs are static views of the countryside and an insult to the intelligence of young students as the dress and automobiles pictured portray the style of the late Thirties.

Unfortunately one feels that the people of France are reduced to a cheerful, hardworking, thrifty group who manufacture women's clothes and perfumes and dance at folk festivals. There is hardly a word written about French automotive and aeronautical accomplishments, original atomic research and excellence of air, road, rail, and water communication throughout the country.

How helpful can such vague and erroneous statements be in understanding the geography of France as the following? "The Jura Mountains . . . are actually a high plateau between the Rhine and Rhone rivers." "The Vosges Mountains . . . are a continuation of the Jura Mountains."

A history of France without mention of her colonies and difficulties in Algeria is but a shallow portrayal of events which have shaped the France of the Fifth Republic.

AUBREY DIEM

Waterloo University College

C. B. Colby. **Snow Surveyors, Defenders Against Flood and Drought.** Coward-McCann, Inc., 210 Madison Ave., New York 16, N.Y., 1959. 48 pages with 59 black and white photographs. 1 map. $2.00.

This compact volume contains 40 topics of which some of the titles are: Tools of the Trade, Snowflake Trapper, Down the Hatch, Weighing a Future Flood, and Radioactive Reporter. On every one of the 7½ x 10½ inch pages there appears at least one, and sometimes more, clear cut photograph, many of which are one-half page in size. Most pictures are accompanied by a brief text of three to six sentences.

The author's introductory section, "White Treasure," explains the need for and significance of snow surveying and tells briefly the origin of the survey idea and its organization at Federal, state and local levels. The scope of the survey is explained and the areas affected are described and mapped.

The sequence of pictures tells the story of the snow surveyors: the training needed, living in the open, traveling over hazardous trails, sampling and interpreting snow cores, and using the most recent techniques to determine nature's stored-up water supplies.

The text makes direct use of the photographs and the reader will want to find the details mentioned. The amount of content packed into a few sentences not only serves to describe but to explain the reasons why such practices are followed.

Most of the books in this Colby series provide enjoyable and interesting reading for pupils of the intermediate and early secondary levels. At

both the school and city library some of the volumes are so popular that they get "lost" or become very tattered in a short time.

M. MELVINA SVEC

College of Education
Oswego, New York

Leverett G. Richards. **Ice Age Coming?** The John Day Company, Inc., 1960. 128 pages with photographs, index and table of contents. $3.25.

This informative book provides delightful reading. It is written for people 11 years of age or older.

Mr. Richards begins with a brief description of the various ice periods of the earth and then continues to explain the action of glaciers and their effect on the landscape and weather. There is an interesting chapter which relates some of the unusual characteristics of ice. Ice can be used to make roads, used for armor, to repair air planes, and even in the construction of ships!

The book continues with a description of icebergs ("Mountains That go to Sea") and the Antarctic ice. The reader is introduced to the type of work done by glaciologists, their equipment, and their terminology.

After investigating the activities of some of the most important continental glaciers, the Greenland Ice Cap and Antarctica, Mr. Richards then proceeds to discuss whether or not there is another ice age coming. He does not answer the question, but he does provide the reader with some extremely interesting theories currently offered by various scientists who are making detailed studies of the behavior of the world's ice.

These theories range from the effect of sun spots on our weather to the one which suggests that there may soon be another shift in the skin of the earth which would cause the Antarctic to move northward and North America to shift toward the equator.

This book is a valuable contribution to a knowledge and understanding of glaciers, bergs, and ice caps. It is an excellent summary of all that men know about the earth's ice. I would recommend it for elementary or secondary school libraries as well as for colleges.

JOHN A. BONHAM

North Brandywine Junior High School
Coatesville, Pa.

Elizabeth Clemons. **Rocks and the World Around You.** Coward-McCann, Inc., New York, 1960. 109 pages. Over 70 illustrations by Robert Gartland. $3.50.

Elementary and junior high school teachers will be pleased with this valuable tool for the junior rockhound. In it the basic classification of rocks is presented in simple language well suited to the 10 to 14 year old age group. At the same time the terms used are those of the professional geologist. Thus the ideas gained may serve as a sound basis for more advanced study.

An introduction is designed to catch attention and stimulate interest in rock collecting. ". . . a rock is never 'just a rock.' It is a definite kind of rock." This approach introduces the idea that one of the major reasons for differences in rocks is variety in mineral content. A discussion of mineral identification includes color, streak, hardness, crystal form, cleavage, fracture, luster, and specific gravity. These characteristics are then used to describe major rock forming minerals, concentrating on quartz, calcite, mica, feldspar, and hornblende.

The section on rocks includes the topics "Extrusive Igneous Rocks," "Intrusive Igneous Rocks," "Sedimentary Rocks," "Metamorphic Rocks," and "More About Rocks and Minerals." Other sections deal with metallic minerals, nonmetallic minerals, and ways to mark and store collections. The illustrations aid in understanding the text materials.

A few mistakes need correcting in the next printing. These are not serious, however, and detract very little from the value of the book for youngsters interested in earth science.

JAMES WOODALL TAYLOR

Wisconsin State College
Eau Claire

Harry C. Rubicam, Jr. **Men at Work in the Mountain States.** G. P. Putnam's Sons, New York, 1960. 128 pp. Illustrated and Indexed.

Men At Work In The Mountain States is an interesting book concerned with the geography of the Rocky Mountain region. Particularly recommended for children 8-12 years, the book portrays the Rocky Mountain area as an important cultural and economic region, contributing significantly to the well-being of the United States as a whole. This book provides a sound, modern, elementary account of this area, previously described on the television screen as a land of gun fighters and cattle drovers, where the only equalizer was the Colt .45.

In the pages of this book the young reader watches modern men working in the great mining centers at Butte, Montana and Leadville, Colorado; he sees oilmn drilling in Wyoming, Colorado, and Montana; and he inspects the steel mills at Pueblo, Colorado. He witnesses farmers irrigating crops, and men working in beet fields and sugar factories. He reads of men laboring in the cotton fields of New Mexico and Arizona, and in the potato fields of Idaho and Colorado. Cowboys are interviewed, and the work of the sheep rancher is studied. The reader visits the cadets at the Air Force Academy, and the men who are building the Titan and Vanguard missiles near Denver. He learns of men at work and play in the rodeos, parks, and ski areas of the Rocky Mountains.

The easy-to-read, conversational style of writ-

ing, italicized technical terms, and generous illustrations should make this book appealing to the geographically awakening mind.

Benjamin F. Richason, Jr.
Carroll College
Waukesha, Wisconsin

Evelyn Stefansson. **Here is Alaska.** Charles Scribner's Sons, New York, 1959. 171 pages with 74 illustrations, one two-page map of Alaska, table of contents and index. $3.50.

This is a revised statehood edition of a book first published in 1943. The author, Evelyn Stefansson, whose chief interest, like that of her husband, Vilhjalmur Stefansson, is anthropology, has written a book that retains much of the anthropological material of the first edition. But in addition considerable emphasis is placed on industrialization and the concomitant growth of cities and towns as well as arctic defense.

The preface written by Viljalmur Stefansson, Arctic consultant in the Northern Studies Program at Dartmouth College, introduces the author, his wife, and describes her travels in Alaska. Mrs. Stefansson not only has traveled widely in Alaska during her research, but she has studied and lectured at the University of Alaska at College. She is therefore well-qualified to write about Alaska, its people and the problems that confront them.

Chapter 1, *Forty-Ninth State,* describes some of the events leading up to the admittance of Alaska to the Union and the meaning of statehood to the Alaskans. Chapter 2, *Fact and Fable,* discusses weather and climate; transportation and communication problems; significance of the DEW Line; fishing; mining; and some of the misconceptions about Alaska. Chapter 3, *Capitals Old and New,* describes early Russian settlement, the purchase of Alaska; Sitka (the capital of Russian America); and the present capital, Juneau. Chapter 4, *The First Families,* presents a very interesting treatise on the life of the Eskimos with some facts about the early Indians of the area. Chapter 5, *Life in a Northern Village,* describes in detail the life and the problems of the Eskimos in the village of Unalakleet, a typical coastal village facing the Bering Sea at the head of Norton Sound. Chapter 6, *Interesting Islands,* gives the reader good insight into the economic life and some of the problems of the few people who live on such islands as the Little Diomede, the Pribilof group, and the Aleutians. Chapter 7, *Other Alaskan Cities,* treats in some detail the city of Anchorage, the international hub; Fairbanks with its gold mining and the University at College; the agricultural experiment at Matanuska; Ketchikan with its fishing industry; and the village of Barrow.

The book is interestingly written and contains a great amount of material not only of interest to the teacher of geography but to anyone interested in Alaska.

Floyd F. Cunningham
Southern Illinois University

Pradyumna P. Karan with the collaboration of William M. Jenkins. **Nepal.** University of Kentucky Press, Lexington, 1960. 95 pages with illustrations, maps, and geographical bibliography. $10.00.

Professor Karan has placed all students of Asia in his debt through the presentation of his handsome volume on Nepal. This country, once among the least known in the world, is now described in detail. The author writes from first-hand experience so that the book carries the stamp of authenticity. The dozen short chapters cover the conventional aspects of geography and are enriched by three dozen maps, five dozen photos, and hundreds of references.

The maps, and their large format, call for special comment. All are of necessity preliminary and generalized, but they present the striking regional contrasts in the environment and the cultural pattern.

Nepal's geography ranges from heights of Mt. Everest (Chomolugma) to the Terai swamps. Climate, vegetation, and land use all reveal the country's vertical zonation. There are also gradations from the wetter east to the drier west. Whereas the Katmandu Valley has a population density of 2,000 per square mile, parts of the Terai average less than a hundred. A chapter on disease and diet points out that Nepal is one of the few remaining areas with pestilential disease.

For the benefit of those who may not see the volume, it may be well to indicate a few facts. Ten per cent of Nepal is under cultivation, but only 20 per cent of the arable land produces more than one crop a year; rice dominates. The total population numbers eight million, but the area is only equal to that of Alabama, which it matches in latitude though not in relief. Poor coal is present, but metalic deposits are of doubtful value. Hydroelectric potentials are large.

George B. Cressey
Syracuse University

Edna Mason Kaula. **The First Book of Australia.** Franklin Watts, Inc., New York 22, N.Y. 59 pages, glossary and index, $1.95.

This book is a useful and accurate introduction to Australia for students of all ages. The author was born in Australia and she uses the Australian "lingo" very effectively in describing the people and their ways. Excellent drawings probably do more to portray many aspects of both the life of Australians and their landscape than a collection of photographs. The configuration of the continent, its resources, settlement, economic development, the life of the Aborigines,

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the daily life, work and recreation of other Australians, states and major cities, government, the Great Outback (the desert heart of Australia), and wildlife are treated generally, while the Snowy Mountain Project, the flying doctor service, sheep farming, the swagman, and the meaning of Anzac receive specific treatment.

The large map covering two opening pages is useful for general locational purposes. It is unfortunate, however, that the symbol for railways is given in the legend and then only Perth, Adelaide and Alice Springs are joined by railways. This is misleading as the other major cities are also connected. The general locational term "Down Under" includes not only Australia but also New Zealand. The description of bays in Sydney harbor are "mysterious," of Brisbane as a "play city" and of the small islands of the Great Barrier Reef as "vivid islets" are perhaps the only blemishes in a well-written book.

THEO L. HILLS
McGill University
Montreal, Canada

Edward H. Winter. **Beyond the Mountains of the Moon: The Lives of Four Africans.** University of Illinois Press, Urbana, Illinois, 1959. xii and 276 pages with photographs and index. $5.50.

Dr. Winter, professor of anthropology at the University of Virginia, presents the life histories of four members of the Amba tribe of western Uganda, collected during three years when he lived among these peoples.

This society judges a man by the number of wives and children he has and the number of love affairs which he carries on outside his marriages. Unlike most tropical regions the natural environment in this little bit of Africa is sufficiently favorable so that the cultivating wife can produce almost everything the family needs, and hence the man is free to pursue other interests. There is shown a close relationship between environment, and attitudes and activities of the people.

This book gives important insights into the lives of people in Africa, which is seething with unrest as it vaults through generations of experiences into independence in a short space of time. The great gulf which exists between the mass of Africans living south of the Sahara and the Western World is apparent; showing reason for the utter confusion, often extending into anarchy, found today in the Congo and other parts of Africa. For Africans, we need a depth of understanding far beyond that which we use in dealing with most other peoples.

This is interesting reading comparable to the great anthropological reporting of Cooper-Cole, Mead, and Herskovits. Geographers will find this book profitable, both for the better understandings which can be gained and for the pleasure that will be found in the reading.

GABRIEL P. BETZ
California State College
California, Pa.

Edward Everett Dale. **The Range Cattle Industry.** University of Oklahoma Press, Norman, 1930; New Edition, 1960. xv and 207 pages. 17 maps, 11 photographs. Classified bibliography and index. $4.00.

Originally published in 1930 and long out of print, *The Range Cattle Industry* was determined by a recent survey of the demand for material on the American West to be one of the 20 most wanted books in that field. This second edition in a new format resulted from that demand.

As the subtitle indicates, the volume is a historical account of cattle ranching in the Great Plains from the end of the Civil War to 1925. The period is placed in perspective as a short span in the history of settlement and development of the American continent. Cattle ranching developed east of the Mississippi on unoccupied and unclaimed lands on the frontier of settlement. It migrated westward before the advance of crop culture, occupying a narrow zone between areas of intensive agriculture on the east and the untamed wilderness on the west.

As the frontier of settlement advanced into the grasslands beyond the Mississippi, the advance guard of livestock grazers suddenly spread rapidly into the plains until it occupied an area larger than all the crop land east of the Mississippi. This was the nature of much of the Trans-Mississippi West during the decades following the Civil War. Range cattle ranching was carried out on a vastly greater scale than was previously possible, until the slower but steady advance of the homesteader invaded the plains and alienated most of the land suitable for crops. The range cattle area gradually shrank into the rougher and more arid lands of the west.

The vast heards which once grazed the open range were greatly reduced. Most of the large ranches were broken up and the industry shifted to relatively small producers. Practices of range conservation, better breeding, winter feeding, and earlier marketing to corn belt feeders were more or less forced upon the cattlemen. The romantic "cow country" passed into history but it retains the interest of succeeding generations of Americans, scholars and television viewers alike.

JAMES E. COLLIER
University of Missouri

Pine, Tillie S. and Joseph Levine. **Air All Around.** Illustrated by Bernice Myers. Whittlesey House, McGraw-Hill, 330 W. 42nd St., New York, 1960. 48 pp.

Air All Around is the most recent of the science books written for younger children by Pine and Levine. This book is informative, it is interesting, and it is attractive. The text begins with a riddle:

You cannot see it.
You cannot taste it.
You cannot smell it.
And—
you cannot live without it.

FORTHCOMING BOOKS FROM FREEMAN

Physical Geography of Asiatic Russia

By S. P. SUSLOV. Translated from the Russian by NOAH D. GERSHEVSKY
Edited by JOSEPH E. WILLIAMS. *Approx. 600 pp., 172 figures, 53 maps.*
Published February, 1961

An adaptation of the late Professor Suslov's text on Asiatic Russia, in which all the geographical divisions are examined genetically and described geologically and geographically, with emphasis on modern structure, seasonal changes, and reconstruction in relation to the economy. Of value not only to geographers but also to geologists, geomorphologists, and biologists.

CONTENTS: Part I. WESTERN SIBERIA: 1. The Western Siberian Lowlands; 2. The Altai. **Part II.** EASTERN SIBERIA: 3. Salair-Kuznetsk Mountain Region and Kuznetsk Basin; 4. Eastern Siberia; 5. Eastern Siberia Arctic Region; 6. Central Siberia; 7. Northeastern Siberia; 8. The Sayan Mountains, Tannu-Ola Range, and Tuva Basin; 9. Baikalaia: Trans-Baikal and Pre-Bikal. **Part III.** THE FAR EAST: 10. Amur Primorski Region; 11. Northwestern Coast of the Sea of Okhotsk and Sakhalin Island; 12. Kamchatka-Kurile Volcanic Region. **Part IV.** CENTRAL ASIA: 13. Semidesert Region of Central Asia; 14. Desert Region of Central Asia; 15 Mountain Region of Central Asia. General Bibliography; Index to Plants; Index to Animals; General Index.

History of The Earth

An Introduction to Historical Geology

By BERNHARD KUMMEL. *Approx. 700 pp., 462 figures. Published January, 1961*

Here is an unusually broad perspective of earth history. Drawing on all aspects of geology—paleontology, stratigraphy, and structural geology—as well as other scientific disciplines, Dr. Kummel presents critically and logically on a world-wide basis evidence on the progressive change and development of the earth's crust. Not only is the student given a sound introduction to the methods of historical geologists but also an understanding that there are problems still to be solved in this dynamic subject.

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JUST PUBLISHED

Paleogeological Maps

By A. I. LEVORSEN. *174 pp., 102 illus., 1960, $6.00*

The paleogeologic map is a valuable tool for exploring the geologic history of an area. This book discusses the preparation of such maps and considers some of the interpretations that can be made from them. A few of the problems to which paleogeologic maps may be applied are pre-unconformity structure, time of deformation, location of wedge belts of sediments, time of oil and gas migration, earth ruptures, and continental drift. The book contains many paleogeologic maps—of oil fields, of regional areas, and of continental areas—and the reader is encouraged to work out the geology and the principles involved in order to develop a sense of analysis of geologic history. This book will be useful to students as well as to practicing geologists, since it promotes a better understanding of the geologic episodes of large and small areas.

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The title of each of the twelve sections of the book is a question. Each question is answered with simple, factual information which is followed by several experiments with instructions so specifically and so clearly stated that children are able to carry out the directions independently. Where is air hidden? Is an empty can really empty? Can you squeeze air? What makes a parachute work? What helps a glider fly? What makes a jet plane zoom off into space? Why does mother open windows top and bottom when the room is too warm? The answers to these every day questions which children often ask compose the content of this book.

The make-up of the pages contain a good balance between text and pictures. The wide margins, clear type, and smaller size of the page appeal to younger children. The many intriguing two-color sketches and diagrams furnish additional meaning to the text and suggest a touch of humor.

The chief value of this book lies in the fact that some basic concepts concerning air are written in a simple, usable manner for children. This book may be used by a teacher or a parent with children who do not read or it may be used for individual do-it-yourself material for children who read independently.

MARY WITT

Florida State University

Arensa Sondergaard. **My First Geography of the Suez Canal** and **My First Geography of the Panama Canal.** Little, Brown and Company, Boston-Toronto. 62 pages and 60 pages respectively with illustrations. $3.50 each.

Though these books are entitled "My First Geography, etc." their theme is mainly an historical account of building the canals as influenced by some of the elements of the natural environment.

The difference in the length of historical knowledge of the areas, about 4,000 years for the Suez versus some 400 for the Panama, emphasizes the many schemes for connections at Suez. Unfortunately the one Atlantic-Pacific link, the Trans-Isthmian railway of the middle 20th Century, is not mentioned.

In the account of the Suez the animals and birds of the area are illustrated and identified while in the Panama account general statements of animal life are made only the parrot family seems to be recognizable. A world map illustrates the mileages saved by the Suez route, a similar map would have enhanced the Panama narrative. However, the latter includes a detailed map of the Panama Canal.

These interesting and well-illustrated books seem to be suitable for grade 6.

ANNEMARIE KRAUSE

Southern Illinois University

Erwin Raisz. **Mapping the World.** Abelard-Schuman, 404 Fourth Ave., New York, 1956. 114 pages with 76 illustrations and index. $3.00.

Dr. Raisz is one of America's greatest cartographers and probably the leader in realistic portrayal of landforms. His contributions to geography have been many. In this volume, an excellent cartography for youngsters, he has turned his efforts to a challenge somewhat foreign to his previous work.

Consideration is given to elementary map reading and navigation, to the history of maps, and to surveying and other techniques of gathering field data.

Complex ideas are not entirely avoided. Dr. Raisz succeeds in explaining many of these in remarkably clear and simple language. The textual material is thoroughly reinforced by functional illustrations. *Mapping the World* is an example of good juvenile nonfiction; it is proof that such literature is not the proprietary domain of the professional writer, but is open to the professional scientist if he care to accept the challenge.

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An Introduction to Geography was written for introductory courses: Regional Geography, Geography of the World, Elements or Principles of Geography. We'll be pleased to send you a copy on request.

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